

RAND

Prior Service Personnel

A Potential Constraint on Increasing Reliance on Reserve Forces

*David W. Grissmer, Sheila Nataraj Kirby,
Richard Buddin, Jennifer Kawata,
Jerry Sollinger, Stephanie Williamson*

This document has been approved
for public release and sale; its
distribution is unlimited.

National Defense Research Institute

19941207 014

The research described in this report was sponsored by the Office of the Secretary of Defense (OSD), under RAND's National Defense Research Institute, a federally funded research and development center supported by the OSD, the Joint Staff, and the defense agencies, Contract MDA903-90-C-0004.

Library of Congress Cataloging in Publication Data

Prior service personnel : a potential constraint on increasing reliance on reserve forces / David W. Grissmer . . . [et al.].

p. cm.

"Prepared for the Assistant Secretary of Defense (Personnel & Readiness)/Reserve Affairs."

"MR-362-OSD."

Includes bibliographical references.

ISBN 0-8330-1508-7

1. United States—Armed Forces—Reserves. 2. United States—Armed Forces—Recruiting, enlistment, etc. 3. United States—Armed Forces—Operational readiness. I. Grissmer, David W. (David Waltz), 1941–. II. United States. Office of the Assistant Secretary of Defense for Personnel and Readiness. III. United States. Office of the Assistant Secretary of Defense (Reserve Affairs).

UA42.P85 1994

355.37'0973—dc20

94-704
CIP

RAND
Copyright © 1994

RAND is a nonprofit institution that helps improve public policy through research and analysis. RAND's publications do not necessarily reflect the opinions or policies of its research sponsors.

Published 1994 by RAND

1700 Main Street, P.O. Box 2138, Santa Monica, CA 90407-2138

To order RAND documents or to obtain additional information, contact Distribution Services: Telephone: (310) 451-7002; Fax: (310) 451-6915; Internet: order@rand.org.

Accession For		
NTIS	CRA&I	<input checked="" type="checkbox"/>
DTIC	TAB	<input type="checkbox"/>
Unannounced		<input type="checkbox"/>
Justification		
By		
Classification		
Accession Codes		
Dist	Priority for	
	Critical	
A-1		

RAND

Prior Service Personnel

A Potential Constraint on Increasing Reliance on Reserve Forces

*David W. Grissmer, Sheila Nataraj Kirby,
Richard Buddin, Jennifer Kawata,
Jerry Sollinger, Stephanie Williamson*

*Prepared for the
Office of the Secretary of Defense*

National Defense Research Institute

This study addresses an important issue in determining the future size of active and reserve military forces. Some future force scenarios place greater reliance on reserve forces by large active force reductions and smaller reserve reductions. Such scenarios assume that reserve readiness can be adequately maintained regardless of the extent of active reductions compared to reserve size. This study explores a potential constraint on reserve force reliance associated with limits on the availability of experienced active veterans for reserve service.

The reserve force inventory of part-time personnel in FY89 used active force veterans (prior service) in about 45 percent of enlisted positions and over 55 percent of officer positions. These prior-active-service personnel fill an even greater proportion of higher-ranking reserve positions and certain critical skills, such as pilots. The current availability of active veterans would be expected to fall markedly with large reductions in the size of the active forces. Replacement with personnel without active service could result in a significantly less-experienced reserve force in those skills where prior active service may be important to reserve readiness.

This study projects the future prior-active-service content of the reserve components under alternative active and reserve force size scenarios. This will aid policymakers in determining the possible limits to active force reduction in proportion to reserve force size. The study also begins to explore the ramifications of the potentially reduced supply of prior-service accessions for reserve personnel readiness and develops a research agenda for further study of this question. This potential decline in the availability of prior-service personnel might be countered to some extent by changing active and reserve personnel and compensation policies that govern the number of active losses and their propensity to join and stay in the reserve. This study identifies such policies and defines a research agenda to determine how effective such policies could be in maintaining prior-service levels under different active and reserve force sizes.

The work was sponsored by the Assistant Secretary of Defense for Reserve Affairs. This research was conducted in the Defense Manpower Research Center (DMRC), which is part of the RAND National Defense Research Institute, a federally funded research and development center sponsored by the Office of the Secretary of Defense, the Joint Staff, and the defense agencies.

CONTENTS

Preface	iii
Figures	ix
Tables	xiii
Summary	xv
Chapter One	
INTRODUCTION	1
Chapter Two	
PS PERSONNEL IN THE RESERVE COMPONENTS	3
Definitions of PS Content	3
Current PS Content of Reserve Components	5
Accounting for Differences in PS Proportions	7
Ratio of Active to Reserve Strength	10
Proportion of Junior Versus Senior Positions	11
Active Loss Rates	13
Propensity of Active-Force Veterans to Join the Reserve	14
Loss Rates for Reserve PS Personnel	16
Summary	18
Chapter Three	
PROJECTING FUTURE PS CONTENT	21
Models and Assumptions	21
Army National Guard and Army Reserve	23
Navy	26
Marine Corps	28
Air National Guard and Air Force Reserve	30
Summary	32
Chapter Four	
DIFFERENCES BETWEEN PS AND NPS PERSONNEL	35
Measures of Difference Between PS and NPS Reserve Personnel	35
Education and Aptitude	36
Military Experience: Traditional Measures	39
Shortcomings of the Traditional Measures	40
Full-Time Equivalent Training Years	41

PS Reservists	41
NPS Reservists	42
Full-Time Reservists	42
Comparing Components Using FETY	42
Comparing the Distribution of FETY for Similar Active and Reserve Personnel	43
Improvements Needed in Measures of Experience	47
Relationship Between Experience and Job Proficiency	47
Job Retraining and Skill Proficiency of PS Personnel	48
Skill Decay in Gaps Between Active and Reserve Service	49
Accounting for Transferable Civilian Experience	50
Measures of Actual Training Time and Quality	53
Summary	53
Chapter Five	
UTILIZATION OF PS AND NPS PERSONNEL	55
PS Content of Low-, Mid-, and High-Level Ranks	56
Utilization of Active-Duty Skills	57
Summary	59
Chapter Six	
RELATING PS CONTENT TO PERSONNEL READINESS ISSUES IN THE RESERVE FORCES	61
Two Reserve Personnel Readiness Issues Arising from Operation Desert Storm	61
Nondeployable Personnel Training for Jobs	62
Maintaining Readiness in High-Priority Units	66
Summary	68
Chapter Seven	
OBJECTIVES, POLICY OPTIONS TO ACHIEVE THEM, AND A PROPOSED RESEARCH AGENDA	71
Policy Objectives	71
Policy Options	71
Maintain a Larger Active-Reserve Size Ratio	71
Adopt a Two-Tier Strategy for Unit Readiness	72
Establish Standards of Effective Experience for Critical Positions	72
Revise Active and Reserve Personnel and Compensation Policy	73
Redesign Reserve Force Enlistment and Reenlistment Bonus Incentives	75
Improve Job Proficiency of NPS Personnel	76
Enhance Incentives for Joint Active-Reserve Commitment Options	76
Integrate the Selected Reserve and Individual Ready Reserve	77
Establish PS Goals	78
Generic Reserve Force Problems	80

Research Directions	81
Job Proficiency of PS and NPS Personnel	81
Behavior of NPS and PS Personnel	81
Appendix	
A. SENSITIVITY OF PS ESTIMATES TO ASSUMPTIONS	83
B. SENSITIVITY OF FETY TO RESERVE TRAINING DAYS	91
References	95

FIGURES

2.1. Distribution of Reserve Officer Personnel in FY89 by Personnel Type and Reserve Component	6
2.2. Distribution of Reserve Enlisted Personnel in FY89 by Personnel Type and Reserve Component	6
2.3. Prior Service Among Part-Time Officers and Enlisted Personnel in FY89	7
2.4. Schematic of PS Content of a Reserve Component That Is Much Smaller Than the Active Force	8
2.5. Schematic of PS Content of a Reserve Component That Is Larger Than the Active Force	9
2.6. Ratio of Active to Reserve Strength by Service in FY89	11
2.7. Lower-Ranking Positions in the Reserve Components in FY89	12
2.8. O-1-O-3 and E-1-E-4 Positions in Reserve Components	13
2.9. Active Loss Rates by Service Among Officers and Enlisted Personnel in FY89	13
2.10. Probability of Joining the Selected Reserve by Service and Selected YOS Groups: FY84 Losses	15
2.11. Probability of Joining Within Six Years After Separation by Service: 4-15 YOS Groups, FY84 Losses	16
2.12. Continuation Rates for PS and NPS Officers by YOS Groups in FY89	17
2.13. Continuation Rates for PS and NPS Enlisted Personnel by YOS Groups in FY89	17
2.14. Annual Loss Rates for PS Reservists in FY89	18
3.1. Flow Diagram for Single Service	22
3.2. Six Active-Reserve End Strength Scenarios: Army Officers	23
3.3. Six Active-Reserve End Strength Scenarios: Army Enlisted Personnel	24
3.4. Percentage Prior Service in Inventory, FY2010: ARNG Officers	25
3.5. Percentage Prior Service in Inventory, FY2010: ARNG Enlisted Personnel	25
3.6. Percentage Prior Service in Inventory, FY2010: USAR Officers	26
3.7. Percentage Prior Service in Inventory, FY2010: USAR Enlisted Personnel	26
3.8. Six Active-Reserve End Strength Scenarios: Navy Officers	27

3.9. Six Active-Reserve End Strength Scenarios: Navy Enlisted Personnel	27
3.10. Percentage Prior Service in Inventory, FY2010: USNR Officers and Enlisted Personnel	28
3.11. Six Active-Reserve End Strength Scenarios: Marine Corps Officers	29
3.12. Six Active-Reserve End Strength Scenarios: Marine Corps Enlisted Personnel	29
3.13. Percentage Prior Service in Inventory in FY2010: USMCR Officers and Enlisted Personnel	30
3.14. Air Force Sizing Scenarios	31
3.15. Projected Percentage Prior Service in Officer Inventory in 2010	31
3.16. Projected Percentage Prior Service in Enlisted Inventory in 2010	32
4.1. Educational Attainment of Active and Reserve Officers in FY89	37
4.2. Comparison of Active and Reserve Enlisted Personnel by Educational Levels in FY89	37
4.3. Comparison of Active and Reserve Enlisted Personnel by Aptitude Category in FY89	38
4.4. Average Years of Service: Active and Reserve Officers, FY89	39
4.5. Average Years of Service: Active and Reserve Enlisted Personnel, FY89	40
4.6. Comparison of Different Definitions of Experience: Officers, FY89	42
4.7. Comparison of Different Definitions of Experience: Enlisted Personnel, FY89	43
4.8. Mean FETY Among Senior Pay Grades in the Army Guard in FY89	44
4.9. FETY Distribution for Active and ARNG O-4	45
4.10. FETY Distribution for Active and ARNG E-6	45
4.11. Comparing the 10th and 90th FETY Percentiles for Active and ARNG Officers	46
4.12. Comparing the 10th and 90th FETY Percentiles for Active and ARNG Enlisted Personnel	46
4.13. Percentage of PS Personnel Whose Active and Reserve PMOS Match in First Year of Reserve Service	48
4.14. Timing of Entry into the Reserve: Officers, 4–15 YOS, FY84 Losses	49
4.15. Timing of Entry into the Reserve: Enlisted Personnel, 4–15 YOS, FY84 Losses	50
4.16. Perceived Similarity of Reserve and Civilian Jobs: Officers, FY92	51
4.17. Perceived Similarity of Reserve and Civilian Jobs: Enlisted Personnel, FY92	51
4.18. Percentage of Reserve and Civilian Jobs Perceived to Be Very Similar: Officers, FY92	52
4.19. Percentage of Reserve and Civilian Jobs Perceived to Be Very Similar: Enlisted Personnel, FY92	52

5.1. Percentage Prior Service Among Part-Time Officers by Pay Grade in FY89	56
5.2. Percentage Prior Service Among Part-Time Enlisted Personnel by Pay Grade in FY89	56
5.3. Percentage of PS Reservists Using Active-Duty Skill over Time	58
6.1. Percentage Skill-Qualified in Active and Reserve Components in FY89	62
6.2. Percentage in Same Unit and Same Skill over 18 Months in Active and Reserve Components in FY89	63
6.3. Distance of Unit Migration Among Those Changing Units in ARNG and USAR	64
6.4. Median Retraining Time: Reserve Enlisted Personnel	65
6.5. Percentage of Enlisted Personnel Not MOS Qualified in Different ALO Units	66
6.6. Percentage of PS Enlisted Personnel in Different ALO Units	67
A.1. Sensitivity of ARNG PS Estimates to Different Assumptions	83
A.2. ARNG PS Content Estimates for Enlisted Part-Timers Under Different Assumptions in FY89	84
A.3. ARNG PS Content Estimates for Enlisted Full-Timers Under Different Assumptions	85
A.4. ARNG PS Content Estimates for All Enlisted Personnel Under Different Assumptions	85
A.5. ARNG PS Content Estimates for Part-Time Officers Under Different Assumptions	86
A.6. ARNG PS Content Estimates for Full-Time Officers Under Different Assumptions	86
A.7. ARNG PS Content Estimates for All Officers Under Different Assumptions in FY89	87
A.8. Average TAFMS Adjustments for FY89 for NPS Personnel	89
A.9. Average TAFMS Adjustments for FY89 for NPS Personnel Excluding Those with Increments > 4 Months	90
B.1. Sensitivity of FETY to Annual Reserve Time: Enlisted Personnel, FY89	91
B.2. Sources of FETY in the Reserve Components: Officers, FY89	92
B.3. Sources of FETY in the Reserve Components: Enlisted Personnel, FY89	92

TABLES

A.1. FY89 PS Content for ARNG	87
A.2. FY89 PS Content for USAR	88
A.3. FY89 PS Content for USNR	88
A.4. FY89 PS Content for USMCR	88
A.5. FY89 PS Content for ANG	89
A.6. FY89 PS Content for USAFR	89

POTENTIAL PROBLEMS IN SUSTAINING RESERVE PERSONNEL READINESS IN THE POST-DRAWDOWN ERA

Operation Desert Storm provided an important reminder that the Total Force Policy instituted at the end of the draft relies heavily on reserve forces. The current restructuring and downsizing of military forces will likely increase this dependence, because the active force structure will likely be reduced more than the reserve force structure. Such scenarios assume that reserve force readiness can be maintained regardless of the extent of active reductions or reserve force increases.

However, reserve readiness may well depend on the availability of individuals with prior active experience. Smaller active force sizes combined with stable or slightly smaller reserve force sizes might significantly lower the proportion of reservists with prior active experience. If these experienced reservists are important to reserve personnel readiness, this would mean that reserve readiness could decline as dependence on the reserve components increases. Thus, this linkage between active force size and reserve levels of experience could be an important limiting factor in the movement to greater reliance on reserve forces.

This study begins to address this issue. It describes the current mix of prior service (PS) and non-prior-service (NPS) personnel in the six reserve components in the Department of Defense and explains the wide variance among components in the utilization of PS personnel. It then projects how the PS content would change for each component under alternative active and reserve force sizes and mixes. It then assesses our current knowledge about the differences and the importance of the differences between PS and NPS personnel and relates the PS content to other personnel readiness issues. It next presents a set of personnel and compensation policy alternatives that aim to boost PS content and address associated personnel readiness problems. Finally, it presents a research agenda for exploring these important issues further.

In FY89, there was a wide variance in the PS content across components and for officers and enlisted personnel. The widely varying proportion of PS personnel in the six reserve components in FY89 can be traced to differing preferences and occupational structures as well as to constraints on the availability of PS personnel. The air components (the Air National Guard [ANG] and the U.S. Air Force Reserve [USAFR]) gen-

erally have the highest proportion of PS officer and enlisted personnel. In FY89, about 75 percent of the part-time officers and 63 percent of the enlisted force had PS. This high PS content was partly attributable to a reserve force size that was significantly smaller than the active force size, creating a large supply of PS personnel relative to demand. The air components also maintain the lowest attrition rates for PS personnel, which means they can maintain a higher content with fewer PS accessions. In fact, they utilize a significantly smaller proportion of active losses than other services and have an excess supply of PS applicants. Finally, the structure of jobs in the air components appears to favor more skilled and experienced personnel with fewer junior-level jobs available for which NPS personnel could more readily serve as substitutes.

The Navy's reserve components are also significantly smaller than its active component, and it maintains a relatively high PS content in its part-time force: about 63 percent for officers and 53 percent for enlisted personnel.¹ However, the significantly higher loss rates for Navy than for Air Force PS personnel mean that the Navy has to utilize a much larger proportion of active losses than the Air Force to maintain its PS content. The Navy utilizes the largest proportion of active officer losses of any service to man its reserve forces, and this level appears to be supply constrained. For enlisted personnel, the Navy enlists a greater proportion of active losses than the air components, but utilizes a lower proportion than the Army.

The Marine Corps also has a reserve force significantly smaller than its active force, and a relatively high 63 percent of its officers had PS in FY89.² The loss rates for Marine Corps reserve (USMCR) officers are also much higher than the Air Force, so the Marines utilize a much larger proportion of active officer losses to maintain reserve forces. This level of PS accessions for officers is probably close to supply-constrained levels. However, the USMCR enlisted force has the lowest level of PS personnel—about 10 percent. This low proportion is primarily due to the highest demand for junior-level personnel among components and a preference for filling these positions with NPS personnel. For enlisted personnel, our data show that the Marine Corps utilizes the lowest proportion of active enlisted losses and may well be able to enlist more PS personnel if preferences and/or demand increases.

Unlike the other services, where reserve force sizes were one-third or less the size of the active force in FY89, the Army active and reserve force sizes were approximately equal in FY89. This helps explain why the Army has the lowest PS proportions of any

¹The estimates of PS content used here are calculated using the fiscal year (FY) 1989 reserve inventory data and consistent definitions of PS, based on reported months of active-duty service (TAFMS) across the six components on the RCCPDS tapes. More recent estimates for PS content in FYs 1990 through 1993 using both our definition and a different methodology requiring matches between active-duty and reserve records show good agreement for our FY 1989 estimates for the officer and enlisted estimates for the Army Guard, Air National Guard, Army Reserve, and Air Force Reserve. However, the newer estimates show higher PS content for the USMCR and the Naval Reserve (NR), especially for officers. This probably indicates an improvement in the TAFMS data since FY 1989 for the USMCR and NR. Given the data problem, the NR and USMCR proportions used as a baseline for our subsequent projections of PS content may be an underestimate. Nonetheless, the estimates of the *change in PS content due to different active and reserve force sizes will not change significantly due to a different initial baseline estimate*. So the methodology and changes in PS content for the NR and USMCR are still valid.

²See footnote above. The number is likely to be closer to 85–90 percent for officers.

component for officers and the lowest of all except the Marine Corps for enlisted personnel. For part-time officers in FY89, the Army Reserve (USAR) had about 55 percent PS, while the Army National Guard (ARNG) had only 35 percent. For enlisted personnel, the USAR had 38 percent, while the ARNG had 34 percent.

For officers, the Army appears to have the highest demand among components for junior-level personnel, but for enlisted personnel, the demand for junior-level personnel is significantly lower than that of the USMCR. However, only about one-third of officer positions and 25 to 30 percent of enlisted positions are authorized for junior-level personnel (O-1 or O-2, E-1 to E-3), leaving the Army wide latitude in filling more senior positions with PS personnel if desired and available. Unfortunately, the Army utilizes the highest proportion of enlisted losses among services and nearly the highest level of active officer losses. Both of these are probably at supply-constrained levels, indicating that higher PS content may not be a choice.

The drawdown will have the greatest effect on the PS content of the Army components. The active Army cuts are proportionately the largest of any service, while the reserve force cuts are smaller than the active cuts. This means that the Army's reserve forces will be as much as 25 percent larger than the active force. Since these reserve components are currently utilizing all qualified PS personnel willing to join, these changes are, in the long run, likely to further reduce PS content unless major changes occur in active and reserve personnel and compensation policies. Given a notional active force of 460,000 and a reserve force of 600,000, our projections show long-term, part-time officer PS contents of 53 percent for the USAR and 28 percent for the ARNG. The corresponding enlisted percentages are 30 and 25. These percentages are below current congressional goals for the ARNG.

Among the other services, the Air Force is scheduled to take the second largest reduction in active force size while maintaining reserve component size. However, the reserve components should be able to maintain close to current levels of PS content by drawing down their queue of active veterans willing to join the reserves. The absence of a queue may make active-to-reserve job matching more difficult, and the utilization of active skills by PS personnel may decline somewhat.

The Navy and Marine Corps active forces are currently scheduled for much smaller reductions than the Air Force and Army. In addition, there appear to be some queues of enlisted veterans to cushion against reductions of PS content. However, these two services currently utilize a high percentage of officer active losses, and modest declines in PS content for officers could occur if reserve forces are not reduced proportionately to active forces.

The potential reduction in PS content may also exacerbate two other personnel readiness problems—particularly for the Army components. The first problem is the number of individuals in units who are not deployable because they lack skill qualifications. In FY89, this level was between 20 and 30 percent for the Army components. These individuals were in training for jobs that were being held open until completion of training. Filling reserve vacancies with already-trained PS personnel can minimize the time jobs remain occupied by personnel who are not qualified for their position. About 40 to 50 percent of PS accessions find jobs that match their active

skills. However, reductions in the pool of active veterans will probably mean more retraining of veterans into new jobs or increased recruitment and training of NPS personnel. In either case, it is likely that there will be more jobs waiting for as yet untrained individuals, and skill qualification rates may fall.

Reductions in PS content would not be as threatening if the reductions could be confined to lower-priority units and noncritical skills. However, under current policies, reductions in PS content could spread to both high- and low-priority units due to the absence of strong incentives to attract and retain PS personnel to the higher-priority units.

POLICY OPTIONS AND A RESEARCH AGENDA

A major threat to future reserve personnel readiness comes from a smaller active force that produces fewer experienced active-service personnel for the reserve forces. It must be referred to as a threat, rather than an actual problem, for three reasons:

- The existence and extent of the problem will be very dependent on the active-reserve mix of each component in the post-drawdown era, which is still uncertain for each service.
- The extent to which NPS personnel or personnel from the Individual Ready Reserve (IRR) could be substituted for PS personnel without impairing readiness is uncertain.
- The effectiveness of personnel and compensation policy initiatives that could be directed toward improving utilization of PS personnel is uncertain.

The downsizing and restructuring of active forces is an historic shift toward reserve force dependence similar to the transition to an all-volunteer force. Making the all-volunteer transition successful took 15 years of significant evolutionary changes in active and reserve personnel and compensation policies. Active and reserve pay levels were adjusted, several new compensation and benefit initiatives were launched, and recruiting and retention strategies were rethought. Many of these initiatives were started as experiments, because the program costs were large and the effectiveness not well estimated. These included enlistment and reenlistment bonuses, G.I. bill-type education initiatives, and developing successful recruiting and advertising strategies. During this period, research helped to determine the effectiveness of each program, so that a cost-effective mix of programs would eventually emerge.

The current shifts in active and reserve forces may require undertaking similar policy initiatives, experiments, and research directed toward making the post-drawdown mix of active and reserve forces viable. This viability may depend on increased and more effective utilization of the declining supply of PS personnel and providing stronger incentives for PS personnel to utilize active skills, and to choose and stay in positions that best take advantage of their experience. On the other hand, it may also depend on finding adequate substitutes for PS personnel among NPS and IRR personnel.

Our recommendations for policies that should be evaluated and tested to sustain reserve readiness in the post-drawdown environment include the following:

- Set appropriate active-reserve force sizes that take account of the linkage between active size and reserve readiness.
- Adopt an effective two-tier readiness policy for high- and low-priority units.
- Initiate appropriately structured proficiency pay for reserve forces to guide experienced personnel to jobs that can best utilize their experience and to stabilize them in those jobs.
- Revise criteria for manpower requirements for critical reserve positions to include experience as well as grade and skill levels.
- Prudently change grade requirements for critical skills in reserve forces to make progression to higher grades possible.
- Revise enlistment and reenlistment policies to encourage better job matching at entry, longevity in jobs, and shorter gaps in service.
- Test, on a larger scale, voluntary incentives for active enlistees to accept reserve terms of service.
- Test options for closer integration and preassignment of IRR personnel into reserve units as mobilization assets.
- Improve training and job proficiency of NPS personnel through periods of active service.

We briefly discuss some of these options below.

ACTIVE AND RESERVE FORCE SIZE

An important policy option for maintaining future reserve readiness is to size active and reserve forces in a way that recognizes the linkage between the relative sizes of the active and reserve forces and reserve readiness. This linkage exists because the active force provides a significant portion of the military experience for reserve force personnel. The active force must be large enough both to maintain readiness in active forces and to provide personnel to maintain reserve force readiness. Active and reserve forces should be sized in a way that provides for sufficient transfer of active military experience to reserve forces to maintain levels of readiness in reserve forces.

All services except the Army maintain reserve forces that are significantly smaller than their active forces. This allows them to maintain relatively high levels of PS personnel in their reserve forces. The Army has maintained active and reserve forces of equivalent size, with the result that low levels of PS content are the only option. In the future Army force mix, the reserve force will be larger than the active force, and under current policies, the reserve PS content could decline further. To the extent that PS personnel are critical to readiness, readiness will also fall. Adjusting this force mix may be important for addressing future reserve readiness problems, although it is not clear that this is an option under current budget constraints.

A TWO-TIER STRATEGY

In the absence of force size adjustments, adopting a two-tier readiness strategy for Army reserve forces is an option. This option would entail maintaining high levels of readiness for a smaller portion of the reserve forces and allowing lower levels of readiness in the remaining units. Implementing this strategy would probably require significant changes both in specific requirements for unit positions and in compensation and personnel policies. Critical positions in higher-priority units would probably need to carry minimum military experience and/or skill experience requirements (discussed below). These requirements, together with proficiency pay (also discussed below) and better-designed enlistment incentives, would motivate PS personnel to seek jobs where they are best utilized and would keep them in these jobs longer. This would enable higher-priority units to gain the experience needed to maintain higher levels of readiness.

REVISE MANPOWER REQUIREMENTS FOR CRITICAL RESERVE POSITIONS

The individual requirements for filling enlisted reserve positions are specified by grade level and skill qualification. These requirements are the same as those for active-duty units, where a grade requirement also implicitly defines a minimum level of experience in the skill. In fact, reserve and active personnel in comparable positions can have considerably different military and skill experience. In some cases, the reservist may have more experience and technical competence than his or her active counterparts; in many others, the opposite may be true. We wish to reiterate that we are not implying that prior active service by itself equates to proficiency in a given skill, nor that this should be the only variable considered. Judgments of local commanders regarding relative proficiency levels of PS and NPS personnel and the levels of experience required in various jobs must weigh in heavily when establishing PS goals. It is important to understand that both PS and NPS personnel will have an overlapping distribution of proficiencies in a given job, which implies that every PS individual is not more proficient than an NPS individual. However, on average, it seems likely that a PS reservist, all other things being equal, is likely to be both more experienced and more proficient in certain jobs than the average NPS individual. Whether this difference in experience is critical can depend on the priority of the unit and the particular occupational skill and grade of the position. For positions with long learning curves in higher-priority units, previous lengthy experience could be critical to job proficiency. If so, this experience should be part of the job requirement.

Currently, some reserve components often lack strong incentives to ensure the best utilization of PS experience. While the active force has the option of promoting and geographically moving personnel and assigning them to positions in occupational skills that best utilize their experience and skills, the reserve forces must recruit and promote individuals in local internal and external labor markets to fill positions. This often means promoting local unit personnel who may be required to retrain into new skills, thereby losing significant previous investment in skill proficiency. Specifying

experience requirements for key positions could help make better use of previous experience. Allowing critical reserve positions to carry higher grade requirements would also help stabilize personnel in critical positions, as would high levels of proficiency pay for critical positions.

PROFICIENCY PAY AND REVISED ENLISTMENT AND REENLISTMENT INCENTIVES FOR RESERVISTS

The changes in manpower requirements for reserve positions probably need to be coupled with establishing proficiency pay for these and other positions. This proficiency pay would vary by grade, skill, unit priority, and level of previous general military experience and/or specific military or civilian job experience. It could provide incentives for PS personnel to seek jobs that utilize their skills and help stabilize them in those positions. Such pay would help counterbalance the current reserve compensation system, which places much higher premiums on promotions rather than longevity in skills, thereby encouraging skill and unit turnover. It could also be directed more broadly to selected skills and higher-priority units, which would also help reduce the general high levels of skill and unit turnover among reserve component personnel.

The objective of stabilizing experienced personnel in jobs and units would also be aided by redesigning enlistment and reenlistment incentives to increase the propensity of PS personnel to enlist and by providing incentives for PS personnel to choose jobs and units that take effective advantage of their experience and skills.

IMPROVING JOB PROFICIENCY OF NPS PERSONNEL

Substitution of NPS personnel for PS could occur across a wider set of grades and skills if more opportunity were available to gain additional training experience. This could occur by having NPS personnel perform full-time job-related service in the active components or reserve service after initial active duty for training (IADT) to more fully complete the on-the-job training required for skill proficiency. Alternatively, NPS personnel could serve for periods of 6 months to 2 years at later points in their careers to prepare for specific jobs.

The major constraints to such extended periods are civilian jobs and families. If such service were required, recruiting and retention could suffer because of the extended absence required from civilian jobs. Reservists now find it difficult to attend additional mandated courses or retraining, which extend for much shorter periods of time. However, some NPS personnel may want the opportunity to perform more extended training, especially if it means more promotion opportunity or higher pay. Currently, there is little incentive for this kind of extended training. Some testing of programs that offer extended full-time training after IADT or at different career points would help define the demand for such programs. However, if links to promotion and pay are not made, demand may not be very high.

INCREASING THE PROPORTION OF ACTIVE SERVICE LOSSES ENLISTING

Active enlistment programs that provide incentives to accept reserve terms of commitments need wider testing. The Army is currently testing enlistment options requiring 2 years of active service and 2 years of reserve service. However, broader tests that expand the range of incentives for accepting reserve commitments and different combinations of enlistment commitments are needed. These programs can potentially make a large contribution to solving potential PS supply reductions. However, their effectiveness will depend on such factors as the amount of incentive needed to accept reserve commitments, how often these individuals utilize active skills, how long they stay in reserve service, and how many could not be effectively utilized because of geographic location.

UTILIZING IRR PERSONNEL AS PREASSIGNED RESERVE MOBILIZATION ASSETS

IRR personnel might be effectively utilized as predesignated reserve mobilization augmentees to jobs that match their skills. The main previous utilization of IRR personnel was as wartime fillers for scenarios with high casualty levels. Since these scenarios are now more unlikely, a small part of the IRR could be affiliated with reserve units to fill unoccupied slots or slots filled by untrained personnel. Such personnel would ensure much higher levels of PS experience for mobilized reserve units. These personnel could also be recruited from a much wider geographic area and perhaps participate in annual training only.

SETTING AGGREGATE GOALS FOR PS PERSONNEL

The current congressional effort to legislate PS content goals in the Army National Guard has focused attention on the linkage between active-reserve mix and PS content. However, there are several problems with an approach that establishes overall goals. The first is that determining the appropriate goal will vary by component and type of personnel. Reserve components with less-complex missions requiring lower levels of skills will require less-experienced personnel than those with more-complex missions requiring higher-level skills.

The goals ideally should be determined from a bottom-up analysis that looks at the importance of prior active service in job proficiency at each skill and grade. Such an analysis would probably show that different levels of prior service would be required for different skills and grades and different components, so setting equitable goals across components will be difficult.

However, simply achieving certain PS levels without ensuring their effective utilization solves only part of the problem. Where PS personnel actually are utilized may be as important as the overall level of PS personnel. PS personnel need to be utilized in the jobs that make most effective use of their previous experience. Goals do not address the utilization problem.

PS goals also cannot easily address transferable civilian experience that some individuals bring to reserve jobs. These goals could create perverse incentives if PS personnel without appropriate skills were used instead of NPS personnel with transferable skills.

Finally, several ambiguities in the current goals and estimates need resolution to make the goals viable. These include defining what part of the force the goals apply to, how to define "active duty service," and how to estimate current PS content. PS content varies considerably between full-time and part-time personnel and also among warrant and regular officers. Thus, goals must specify to which groups they apply. Another definitional problem is that reservists earn "active duty days" while at IADT, annual training, and other types of training. These can cumulate to more than two years of service for more senior reserve personnel. Current data fields cumulate these days with actual active service, making it difficult to distinguish those with two years of continuous active duty from those having accumulated two years from several years of reserve service. While the uncertainty can be narrowed to a few percentage points, it may prove troublesome for application of the goals.

An alternative to a legislated-goal approach is to implement a set of personnel and compensation policies that will provide the incentives and flows to achieve not only the desired levels of prior service but also effective utilization.

RESEARCH DIRECTIONS

Besides the research associated with the initiatives identified above, other research could enable better decisions on the relationship between active-reserve mix and reserve personnel readiness and the relationship between PS content and readiness. One research goal would be to better identify what is valued in PS personnel and the costs of replacing PS personnel. PS personnel initially bring at least three experience-related advantages to reserve service:

- proficiency and experience in a specific skill
- more-generic military knowledge and experience not associated with a specific occupational skill
- a prescreening process that may lower the costs for successfully filling reserve jobs.

The more-generic knowledge and experience can include basic training, military discipline, military operating styles, and leadership and supervisory skills. However, PS individuals may also be valued because completion of an active term of service provides a screening or "credentialing" effect that improves the chances for more-rapid skill proficiency and successful completion of reserve skill training over NPS personnel. Only about two out of three individuals entering active service will complete their term of service. This screening process may significantly increase the likelihood of good performance in reserve service. Such individuals may be able to retrain more quickly and perform well at a variety of military skills. So, the value of prior active service may partly be to identify a pool of individuals who, with a high

certainty, are trainable and perform well. If this pool declines, it may mean significantly higher costs connected with recruiting and screening more NPS personnel to fill reserve jobs.

Research is also needed on understanding the differences in characteristics and job proficiency between PS and NPS personnel and where NPS personnel can effectively substitute for PS personnel. This will involve work at the occupational level to determine what job requirements need to be established for reserve positions. Especially important is to assess the level of civilian transferability that occurs across reserve occupations.

Operation Desert Storm (ODS) provided an important reminder that the Total Force Policy instituted at the end of the draft called for greater reliance on the Selected Reserve Forces. The Total Force Policy was necessary because the All Volunteer force would be smaller than any peacetime force since the Korean War. Moreover, in the absence of a draft, this force would not be as easily or rapidly expandable. The smaller active force meant assigning more missions and earlier deploying missions to reserve forces. During ODS, over 245,000 reservists were activated, and many deployed in the first few weeks.

The current drawdown in the size of the active forces combined with fiscal constraints creates pressure to place even more dependence on reserve forces. A recent statement¹ by the Assistant Secretary of Defense (Force Management and Personnel) states current DoD policy:

It is DoD policy to place maximum reliance on Guard and Reserve units and manpower. We use active units and manpower to support scheduled overseas deployment or sea duty, training requirements, and to support the rotation base. Above that level, we plan to support military contingencies with Guard and Reserve units and manpower when they can be *available* and *ready* within planned deployment schedules on a *cost effective basis*.²

However, a possible constraint on increasing dependence on reserve forces is the fact that, particularly after the conclusion of the active drawdown, we may have to rely on an increasingly less experienced reserve force. The active force provides experienced personnel to the reserve forces; as the size of the active force declines, so would the flow of personnel with active experience to the reserve forces. If these prior-service (PS) personnel are critical to the readiness of reserve units, reserve readiness would also decline. This possible trade-off between increasing reliance and lowered readiness is an important issue in determining the size and mix of active and reserve forces. A key part of analyzing this trade-off is to determine the extent to which new active and reserve compensation and personnel policies can be effective in maintaining PS content.

¹Cited in U.S. Senate Committee on Armed Services, 1992, p. 202.

²*Availability* is a measure of whether the requisite numbers and types of units and individuals can be used by the National Command Authorities. For units, *ready* means the ability to deploy without unacceptable delay; for individuals, it means qualified to perform assigned missions or functions (Joint Chiefs of Staff, 1989).

Congressional concern over this issue has been expressed in two ways. Legislation for FY92³ mandated a study of the structure and appropriate mix of active and reserve forces. Among other things, it specifically called for an analysis of “the sustainability of reserve recruiting and retention”⁴ for alternative force sizes and mixes. In addition, Title XI⁵—The Army National Guard Combat Readiness Reform Act—was passed in response to personnel readiness problems encountered in ODS. The legislation set PS content goals for the Army National Guard of 50 percent of enlisted members and 65 percent of officers; these goals were to be met by FY97. The definition of prior active service was two years of active experience.

This study was initiated in conjunction with RAND’s Force Mix study⁶ and continued after the completion of that study to begin to address the implications of Title XI. The specific objectives are fourfold:

- to estimate the current PS content and to project how the PS content of each reserve component would change, given different active and reserve force sizes;
- to begin to assess how important PS personnel are to reserve readiness;
- to identify the directions for a new set of active and reserve personnel and compensation policies that could maintain or boost PS content with declining active force size;
- to identify a research agenda needed to further explore the issues of the future PS content, its importance to reserve readiness and the effectiveness of changed personnel, and compensation policies to boost PS content.

In Chapter Two, we estimate the FY89 proportion of PS personnel by each component and hypothesize why differences occur among components. Chapter Three provides long-term projections of how the PS proportion would change under different active and reserve force-size scenarios assuming current personnel and compensation policies. Chapters Four, Five, and Six explore the potential implications of changes in the PS content by identifying and describing differences between prior-service and non-prior-service (NPS) personnel (Chapter Four), describing how PS personnel are currently utilized by the reserve components (Chapter Five), and relating the PS content issue to certain personnel readiness issues likely to be encountered in the future (Chapter Six). Chapter Seven identifies a set of structural problems in reserve forces that need solutions to allow more effective use of PS personnel. Chapter Eight identifies new total force policies that might ameliorate the adverse effects of declines in PS content and a research agenda for better defining the implications of the changes and the effectiveness of the suggested compensation and personnel policies.

³U.S. Senate Committee on Armed Services, 1992; U.S. House of Representatives, 1992a, p. 62.

⁴Ibid., p. 64.

⁵U.S. House of Representatives, 1992b, p. 231.

⁶*Assessing the Structure and Mix of Future Active and Reserve Forces: Final Report to the Secretary of Defense*, 1992.

PS PERSONNEL IN THE RESERVE COMPONENTS

Although it would seem straightforward to identify which reservists are active force veterans, there are several issues about the definition of prior service and the quality of the data available to make such estimates. We first address these issues then estimate the proportion of PS personnel in the six reserve components in FY89. This will serve as a baseline for projections made in the next chapter.

The components have widely varying proportions of PS personnel among their part-time personnel. About 75 percent of the part-time officers of the air components (the Air National Guard [ANG] and the U.S. Air Force Reserve [USAFR]) have prior active service, while 35 percent of ARNG officers have prior active service personnel. The enlisted force part-time PS contents range from approximately 10 percent for the Marine Corps to over 60 percent for the Air Force reserve. We end the chapter with an analysis of these differences by component and whether this variation is due to limited supply of PS personnel or limited demand for PS personnel. We do this analysis by looking at the key factors that determine supply and demand for PS personnel across components.

DEFINITIONS OF PS CONTENT

Before estimating the PS content¹ of the FY89 inventories of the reserve components, we must address several definitional issues:

- What kinds of service should count as active duty service?
- How much active service is required to qualify as prior service?
- Should the same criteria be used for part-time and full-time reserve personnel?
- Should warrant officers be included with commissioned officers?

¹It is important to recognize that this measure differs in two ways from conventional usage of the term *prior service*. Current usage usually refers to percentage of accessions rather than actual percentage in the inventory as a measure of PS content experience. This is an important difference, since the new definition takes into account not only how many PS personnel join, but also how long they stay. The second difference is that current definitions include individuals who have *prior reserve* service as well as those who have *prior active* service when reporting the proportion of those with prior service. Our definition, following congressional guidelines, includes only individuals who have *prior active* service. For the Army components especially, the conventional definition overestimates actual prior active service accessions by about 25 percent.

The congressional goals specified a definition of prior service requiring 24 months of active duty. Presumably this was set to correspond to the shortest active-duty term available to enlistees. However, the congressional language did not precisely specify what constituted “active duty.” Reservists are given credit for active duty when attending two weeks of annual training (AT) and initial active duty for training (IADT) or when attending certain military schools for training. By attending annual IADT, annual training over a number of years, and other associated training schools, an NPS reservist could accumulate sufficient active-duty days over a period of years to meet the 24-month definition. However, our definition will attempt to count only continuous active service as a member of the active component by excluding annual training days.²

We will define prior service as requiring 18 months of active service. We use 18 months rather than 24 months because we found a significant group of individuals in the Army who had somewhat less than 24 months of active service. These individuals could have entered with two-year terms, but served somewhat less than two years because of “early out” programs. We wanted to include these individuals as PS personnel. However, we also provide FY89 estimates that use both 12 and 24 months of active duty as criteria to test for sensitivity (see Appendix A).

Prior active-duty service is probably not as important a distinction for full-time reservists as for part-time reservists.³ Full-timers may have significantly more military job-related experience than either prior or nonprior part-time reservists, and the value of prior active service will generally be much less than for part-timers. An argument could be made that full-time reserve service is a substitute for active service, and all full-timers with over two years of full-time service should be counted as PS personnel. Alternatively, one could apply the same PS standard to full-time and part-time personnel. In this study, we will present FY89 estimates using both assumptions about full-time personnel (see Appendix A). However, we will make projections of future content for part-time personnel only.

The question of PS versus NPS content of the reserve forces needs to be considered in the context of reserve readiness and unit capability, not in isolation. Generally, PS personnel bring to the unit considerably more experience than their NPS counterparts, and as such, the PS content of a unit indicates to some degree the level of experience the unit possesses. However, there are important caveats that must be placed on this broad statement. We discuss these later in the report, but a few examples may help to illustrate this point. First, consider reservists who work in jobs that are closely related to their military jobs—medical personnel, pilots, and truck

²We estimate the months of active duty by adjusting the data field—total active federal military service (TAFMS)—obtained from the Reserve Components Common Personnel Data System (RCCPDS). TAFMS measures the months of active-duty military service, but also includes time spent in annual training, IADT and other formal school training in active-duty schools. An adjustment is made to subtract annual training days which accrue to TAFMS throughout the reserve career. An analysis of FY88–89 data showed that the ARNG and USMCR did not increment TAFMS for annual-training days. For these components, we used TAFMS directly rather than the adjusted TAFMS. See Appendix A for additional details on the definitions, the adjustments and the sensitivity of the estimates to the adjustments.

³Military technicians are included in the definition of full-time reservist.

drivers are typical examples. These reservists probably bring as much, if not more, experience to their reserve jobs as a prior active service reservist trained in that specialty. This means that the PS content would not be a good measure of unit capability and experience. Second, consider units that are highly integrated with the active force. For example, approximately one-third of the crews of the Naval Reserve force ships are manned by regular Navy personnel. Again, PS content of such reserve units would not fully measure the wartime capability of these units.

Finally, the congressional goals did not specify whether warrant officers should be included with officers when computing the PS composition. In this study, we provide estimates of FY89 prior service including and excluding warrant officers from the officer group. Projections of future content exclude warrants from the officer group.

Appendix A contains estimates of the sensitivity of our FY89 PS content calculations to these assumptions. We compute for each component the PS content of both officer and enlisted personnel under a definition of 12, 18, or 24 months of active service, alternative treatment of full-time personnel, inclusion of warrants with officers, and different TAFMS adjustments.

CURRENT PS CONTENT OF RESERVE COMPONENTS

We first look at the mix of reserve personnel by component, including both full-time and part-time personnel. Figures 2.1 and 2.2 show for officers and enlisted personnel the composition of the FY89 inventory into three types of personnel: part-time NPS, part-time with prior active service experience⁴ and full-time reservists.

Figure 2.1 shows that about 80 percent of the FY89 officer inventory of the air components had prior active or full-time reserve service. About 65 percent of the Naval and Marine Corps Reserve officers had prior active or full-time reserve service, compared to 55 percent for the USAR and 45 percent for Army National Guard officers.

Figure 2.2 indicates lower proportions of PS or full-time personnel in the inventory of enlisted personnel. In FY89 the inventory of the Marine Corps Reserve had PS or full-time personnel in only about 10 percent of enlisted positions. The Army reserve components had PS or full-time personnel in about 40 percent of enlisted positions, followed by the Naval Reserve (USNR) with 60 percent and the air components with about 70 percent.

The data also show that the two guard components had the largest proportion of full-time officers (includes both military technician and Active Guard Reserve)—about 22 percent for the ANG and 14 percent for the ARNG. The other components have 10 percent or less of full-time personnel among officers. Among enlisted personnel, the

⁴A reserve officer is classified as having prior service regardless of whether the active-duty experience was as an officer or as enlisted personnel. This definition is used throughout the report.

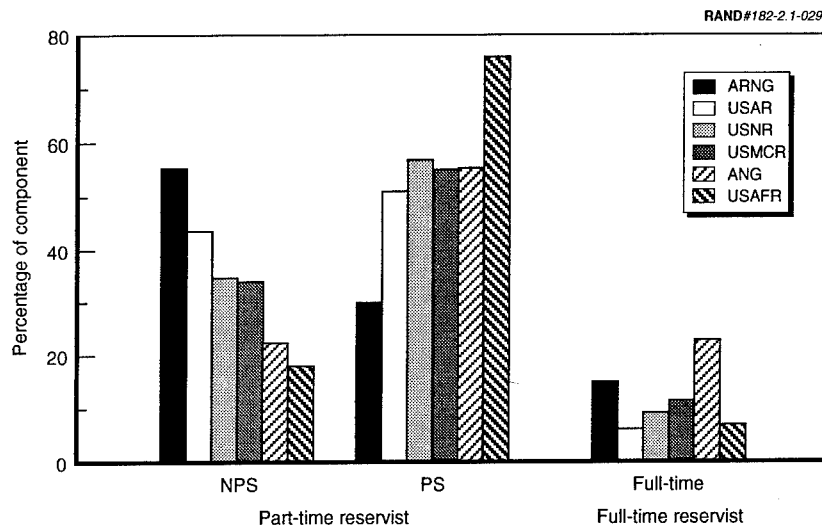


Figure 2.1—Distribution of Reserve Officer Personnel in FY89 by Personnel Type and Reserve Component

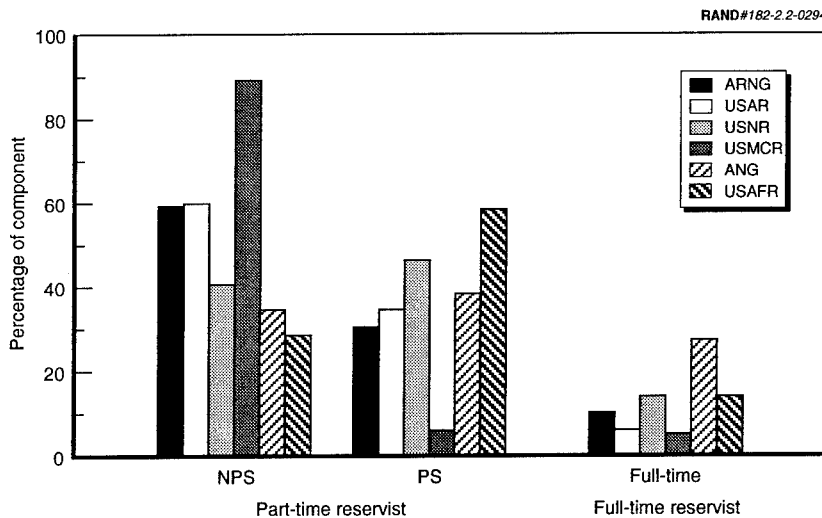


Figure 2.2—Distribution of Reserve Enlisted Personnel in FY89 by Personnel Type and Reserve Component

ANG has over 25 percent full-timers, with the ARNG, USNR, and USAFR having between 10 and 15 percent.

Our main focus in this report is on part-time selected reservists, since they constitute over 85 percent of the force and are most vulnerable to changes in experience mix resulting from an active force drawdown. The proportions of prior active-service personnel in the part-time force are presented in Figure 2.3 for both officers and

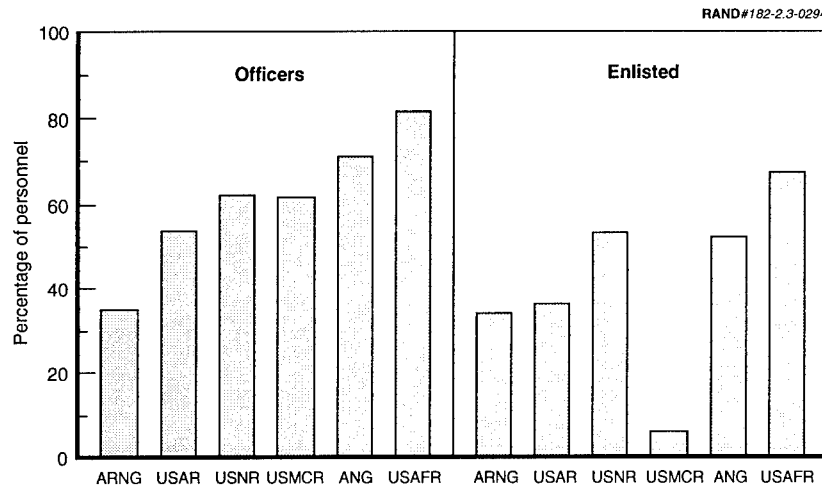


Figure 2.3—Prior Service Among Part-Time Officers and Enlisted Personnel in FY89

enlisted personnel. The two air components have the highest percentage of part-time PS officers, about 75 percent, while the ARNG has the lowest, 35 percent. Among the enlisted, the USAFR has the highest proportions—over 65 percent—compared to 34 percent in the ARNG and only 10 percent in the USMCR.⁵

ACCOUNTING FOR DIFFERENCES IN PS PROPORTIONS

The widely varying proportions of PS personnel can reflect either their limited supply availability or demand constraints imposed by each reserve component, including policies that consciously limit NPS personnel to lower grades. Demand constraints imply that there is an excess supply of PS personnel willing to join but that they are restrained from joining by component policies or available positions. It is important to distinguish between these hypotheses, because the effects of active-force reductions can be quite different if the current inventories are supply constrained as opposed to demand constrained. If the inventory is supply constrained, further active-force reductions will restrict supply further (in the absence of policy changes) and probably lead to lower PS content. If the inventory is demand constrained,

⁵As reported above, the estimates of PS content used here are calculated using the FY89 reserve inventory data and consistent definitions of PS, based on reported months of active-duty service (TAFMS) across the six components on the RCCPDS tapes. More recent estimates for PS content in FYs90 through 93, using both our definition and a different methodology requiring matches between active-duty and reserve records, show good agreement for our FY89 estimates for the officer and enlisted estimates for the Army Guard, Air National Guard, Army Reserve, and Air Force Reserve. However, the newer estimates show higher PS content for the USMCR and NR, especially for officers. This probably indicates an improvement in the TAFMS data since FY89 for the USMCR and NR. Given the data problem, the NR and USMCR proportions used as a baseline for our subsequent projections of PS content may be an under-estimate. Nonetheless, the estimates of the *change in PS content due to different active and reserve force sizes will not change significantly due to a different initial baseline estimate*. So the methodology and changes in PS content for the NR and USMCR are still valid.

active-force reductions may not affect the PS proportion but would only reduce the excess supply.

Determining whether current inventories are constrained by supply or by demand requires a comparative analysis of the flow of personnel through each active component and into its reserve components and tenure once they enter the reserve components. Tracing this process helps to answer important questions, such as whether all PS personnel willing to serve are being utilized and how the PS content is affected by active and reserve force sizes. It also aids in identifying policies that can change the PS content.

A simple schematic will help to illustrate these hypotheses. Figure 2.4 shows how personnel flow from the active to reserve components. It illustrates the factors that can determine the PS content with an active force of approximately 500,000 (bar at the left of the diagram) and a part-time reserve force of 200,000 (bar at the right of the diagram). These force size numbers are more typical of the relative size of the Air Force active and reserve components.

In this example, we have assumed that the annual loss rate from the active force is 1 in 8, or 12.5 percent. This produces a pool of active veterans of 62,500 annually. If we assume that 1 in 5 of these veterans joins reserve forces, PS accessions will be 12,500 annually. The equilibrium level of PS personnel in the reserves, given a flow of 12,500 annually, depends on the average number of years served per enlistment. Here, we have assumed an average of 10 years. The PS equilibrium level is then simply $10 \times 12,500 = 125,000$. With a part-time reserve force of 200,000, we assume the remaining positions are filled by NPS, and the PS content of the part-time force becomes $125,000/200,000$ or 62.5 percent.

Figure 2.5 shows a second alternative that is more illustrative of the Army active and reserve components after drawdown. It assumes an active force size of 460,000 and

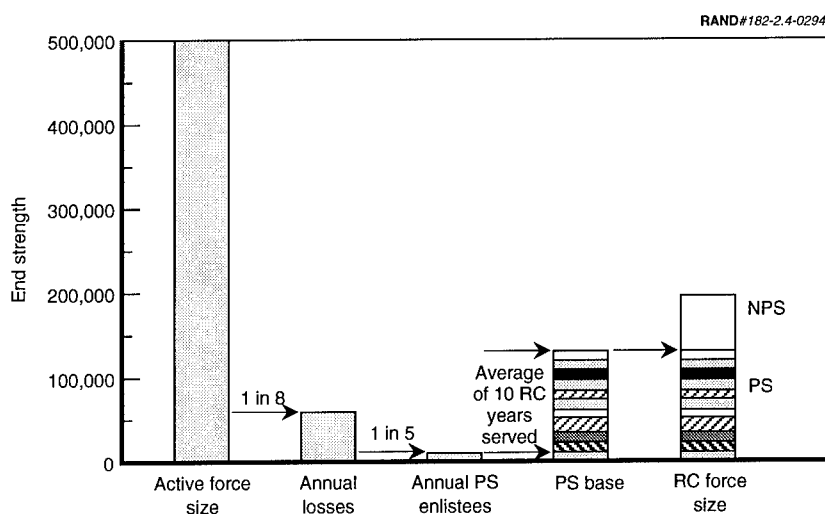


Figure 2.4—Schematic of PS Content of a Reserve Component That Is Much Smaller Than the Active Force

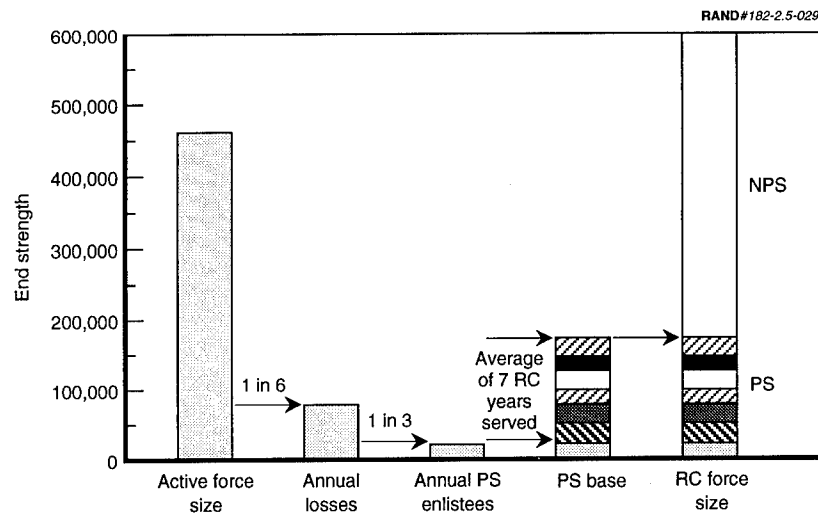


Figure 2.5—Schematic of PS Content of a Reserve Component That Is Larger Than the Active Force

part-time reserve components of 600,000. The data reflect the fact that the Army active loss rates (1 in 6) and the reserve accession rates (1 in 3) are somewhat higher than those for the Air Force. Fewer average years of service per enlistment, however, are assumed than in the Air Force: 7 years. With the assumed data, an active Army of 460,000 produces a PS base of about 175,000. With a part-time reserve force size of 600,000, the PS content would be 175,000/600,000 or almost 30 percent.

The figures help identify the key determinants of the PS content of the part-time force in a simple supply-constrained model:

- the size of the active force
- the average loss rates for active personnel
- the propensity of active veterans to join the reserve
- the average number of years served among PS personnel in the reserve
- the size of the part-time reserve forces.

The PS content of part-time reserve forces will—all other things being equal—be higher if the active force size is larger, active loss rates are higher, the propensity to join the reserve forces is higher, the years served among PS personnel is longer, and the size of the reserve component is smaller.

This simple supply-constrained model assumes that the only constraint on PS content is the availability and willingness of PS personnel to join and stay in the reserves. That is, all jobs are available to PS personnel willing to join. However, some reserve jobs are lower in rank than the last active rank. PS personnel leave the active force having typically achieved minimum ranks of E-4 for enlisted and O-3 for officers. Components may choose to fill jobs below these ranks with NPS personnel

because they may find PS personnel generally unwilling to take lower-ranking positions, or they simply believe that NPS personnel can perform adequately in these jobs and wish to employ PS personnel more effectively in other positions.

Thus, a better indicator of demand for PS personnel than reserve force size will be the number of reserve positions with ranks of E-4 or higher and O-3 or higher. All other things being equal, components with higher proportions of these higher-ranking positions in their structures can generally have higher PS contents.

Finally, more PS personnel may be willing to join than there are units or positions available. This demand-constrained situation can occur either because units do not have positions available for all who want to join or because those wanting to join do not live near enough to a reserve unit. The first case will be evidenced by queues of individuals willing to join specific units and by lower proportions of active losses that actually join the reserves. The second case will generally not create queues, but will lower the proportion of active losses joining reserve forces. It may also be evidenced by individuals joining “second choice” reserve components unaffiliated with their active service component.⁶

We will examine each of these factors for the different components to help explain the widely varying PS content of the different reserve components and to identify what factors constrain the officer and enlisted PS content of each component.

Ratio of Active to Reserve Strength

We first discuss the role of active and reserve force size in determining PS content. The ratio of active to reserve force size provides an initial aggregate indicator of how the potential supply of active personnel compares to the reserve demand for personnel. All other things being equal, it will be easier to man reserve forces with PS personnel if the ratio of active to reserve forces is large.

Figure 2.6 shows this ratio for officers and enlisted personnel of each component for FY89 force levels. The data show that the USMCR has the most favorable ratios for manning with PS personnel, with over 6 active officers and 4 active enlisted personnel for each reservist. The Navy and Air Force also have quite favorable ratios. The Navy has 2.5 officers and 4 enlisted personnel for each reservist, while the Air Force has a ratio of 3.2 for the officer corps and 2.9 for the enlisted force. The Army has by far the lowest ratios, approximately 1 for both officers and enlisted personnel. Based on this measure alone, the Air Force, Navy, and Marine reserves should have

⁶Although we do not show the data here, most personnel join the reserve component of the active service from which they separated. The exception is the ARNG, which recruits about 13 percent of PS personnel from the active Marine Corps, Navy, or Air Force. Presumably this is due to the wider geographical availability of ARNG units. The Navy and USMC have the fewest reserve units, and geographic proximity may constrain their supply of PS personnel more than the Army or Air Force reserve components.

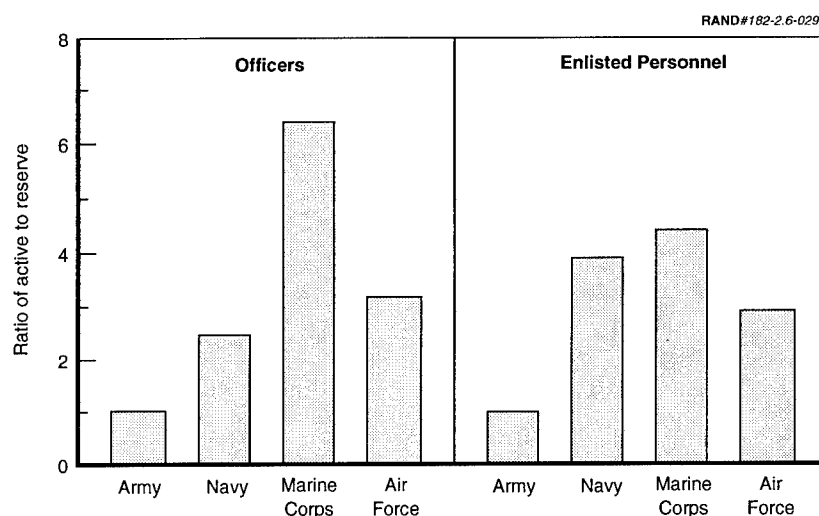


Figure 2.6—Ratio of Active to Reserve Strength by Service in FY89

the easiest time finding prior active service personnel to fill reserve positions, and the Army would have the hardest time.

This factor alone helps explain why the Army PS content for officers is significantly below that of the other components and why the Army enlisted content falls below the air and naval components. At such large reserve force sizes, there may not be enough active Army veterans willing to join to man higher-level positions fully. Clearly, however, this is only one piece of the picture. This factor alone cannot explain the low enlisted PS content for the USMCR. Other factors also play a role in determining PS utilization.

Proportion of Junior Versus Senior Positions

An improved indicator of the demand for PS personnel in a simple model would include the proportion of higher-ranking positions as well as reserve force size. Components with higher-ranking grade structures will be able to enlist and retain PS personnel in these positions much easier than components with lower grade structures. For lower-ranking positions, NPS personnel may be the only option if PS personnel are unwilling to accept these positions. Figure 2.7 shows for FY89 the proportion of grade requirements specified for junior personnel (O-1 and O-2, E-1 to E-3) in the different reserve components.⁷

The air components have the lowest demand for lower-ranking enlisted and officer personnel—less than 10 percent. The Army components have about one-third of

⁷The data came from the components in response to a request from the Director, Total Force Requirements in ASD(FM&P).

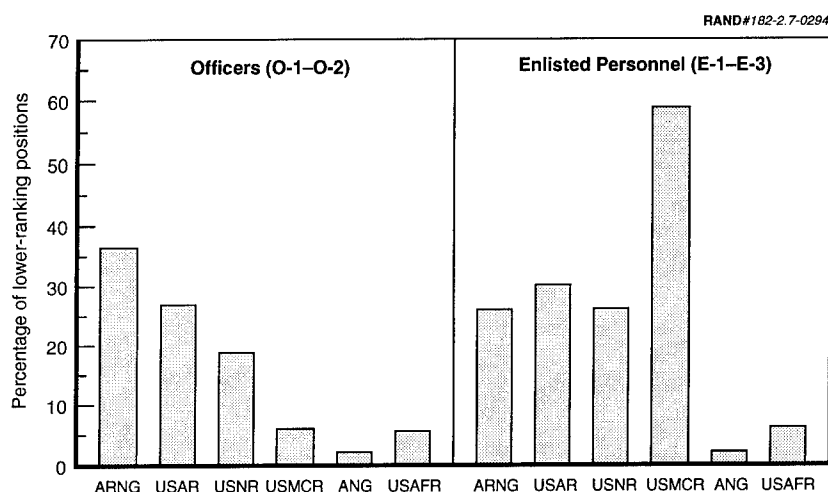


Figure 2.7—Lower-Ranking Positions in the Reserve Components in FY89

enlisted and officer positions specified for junior members. The USNR has less than 30 percent officer and 20 percent enlisted positions designated for junior members.

The Marine Corps Reserve has the highest proportions of lower-ranking enlisted personnel—about 57 percent are designated as junior grades due to their large proportion of infantry units. However, USMCR officer requirements have a small proportion of junior officers—less than 10 percent. They appear to have a policy of manning much of their enlisted force with NPS personnel to fill relatively lower-ranking positions. However, the data for Marine officers indicate a grade structure that allows utilizing PS officers heavily.

The components have little choice in filling these lower-ranking positions with NPS personnel. However, the number of NPS personnel is much larger in each component than the number of lower-ranking positions alone can explain. Figure 2.8 adds the large requirements for O-3 and E-4 positions. At these ranks, the services have some flexibility to fill these positions with lateral-entry PS personnel or to promote lower-ranking NPS personnel. Their decisions will depend on the availability of PS and NPS personnel, the amount of promotion opportunity desired for NPS personnel and relative costs. However, there are clear correlations between this demand for lower- and midgrade personnel, and NPS utilization. The air components still have the lowest demand for lower-ranking personnel and the lowest level of actual utilization of NPS officers and enlisted personnel. The USMCR has the highest demand for E4 or below and the highest utilization of NPS enlisted personnel, while the ARNG has the highest demand for O-1 to O-4 and utilizes the largest proportion of NPS personnel.

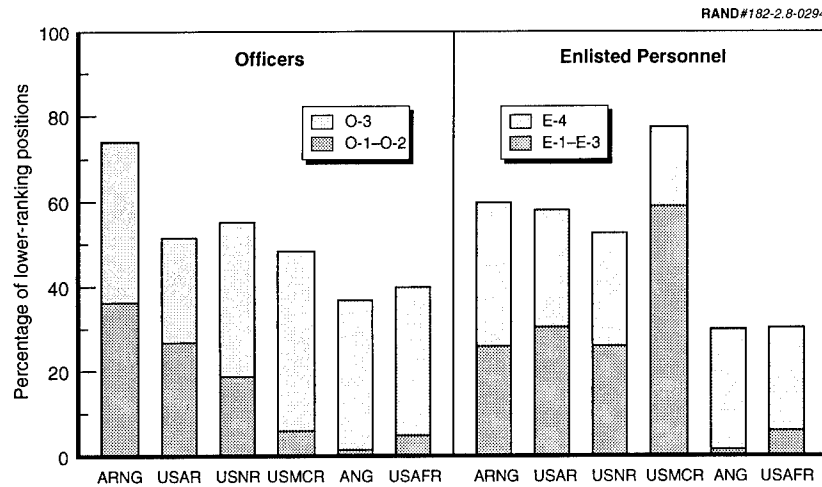


Figure 2.8—O-1-O-3 and E-1-E-4 Positions in Reserve Components

Active Loss Rates

While the relative size of the active and reserve forces is a key underlying determinant of PS utilization, the number of active losses drives the availability of PS personnel. The number of losses is determined both by active force size and active loss rates. At equivalent active force sizes, higher active losses at End of Term of Service (ETS) will make reserve PS manning easier.

Active loss rates vary for officers and enlisted personnel and by service (Figure 2.9). Active loss rates partly depend on the length of the initial term of service and service

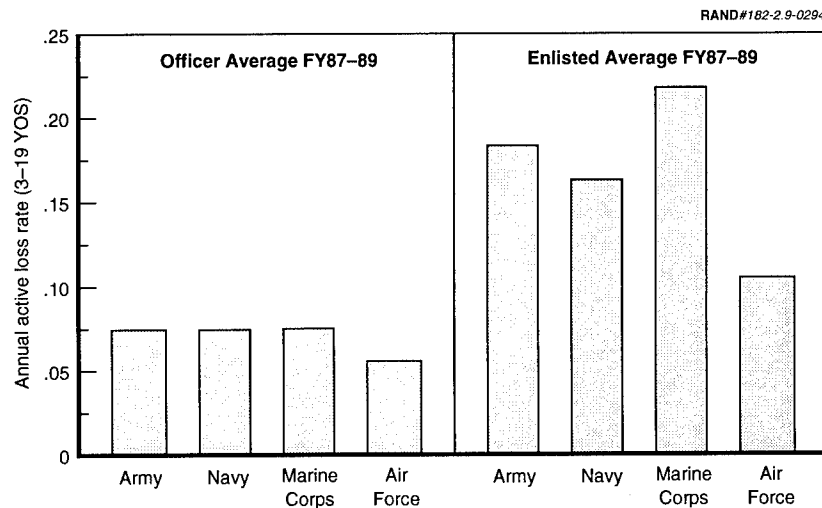


Figure 2.9—Active Loss Rates by Service Among Officers and Enlisted Personnel in FY89

promotion and tenure policies. The Army, Navy, and Marine Corps have generally offered shorter terms of service for enlisted and some officer personnel, with the Air Force generally having the longest terms. This partly explains the higher enlisted loss rates of those services and lower rates for the Air Force.

Officers have much lower loss rates than do enlisted personnel. All other things being equal, this makes reserve officer manning more difficult than enlisted manning and would require higher recruiting proportions among losses to maintain similar PS accession proportions. It is important to note that the loss rates do not have the range of variation of the active-reserve size ratios. This means that force sizes will generally be more important determinants of PS content than loss rates.

Propensity of Active-Force Veterans to Join the Reserve

The propensity of active-force veterans to join the reserve will also determine PS content. This propensity will depend on the type of positions available, reserve compensation, the quality of training and organization of the component, and the compatibility with civilian job and family life. We first present historical rates of active veterans joining reserve forces. However, the empirical evidence on actual enlistment rates may understate the true propensity because of two factors. Not all who wish to enlist may be able to find positions either because there are no openings in nearby units or because there are no nearby units of the appropriate component. If no openings exist, the observed rate of joining will underestimate the actual propensity to enlist. For components with fewer units, the observed joining rate will also underestimate the proportion desiring to enlist. This will be particularly true for the USMCR and USNR, which do not have units as widely available as the air and Army components. Thus, observed joining rates need to be interpreted with these factors in mind.

Figure 2.10 shows the proportion of active FY84 losses with four and eight years of service who joined reserve components by FY89. Approximately 40 to 45 percent of the Army, Navy, and Marine Corps officers who left at four years joined the reserve components within this six-year period compared with only 21 percent of Air Force officers. The lower proportion of Air Force officers is unlikely to reflect geographic unavailability, because the Navy and Marine Corps units are even more scarce. Instead it may reflect either demand constraints or the fact that pilots—who may be in greater demand—usually serve five-year rather than four-year initial terms.

Among eight-year losses, 57 percent of Navy officers and 37 to 43 percent of other service losses joined the Selected Reserve. The Air Force again has the lowest rate of accession among this group; however, the Air Force rate is considerably higher among eight-year losses than among the four-year losses, perhaps indicating that part of the lower four-year rate is due to the absence of pilots in this year group.

For enlisted personnel, the accession rates are significantly lower in almost every case than the officer rates. The Army and Navy reserve components enlisted 41 percent and 34 percent of their four-year losses, respectively, with the Air Force and

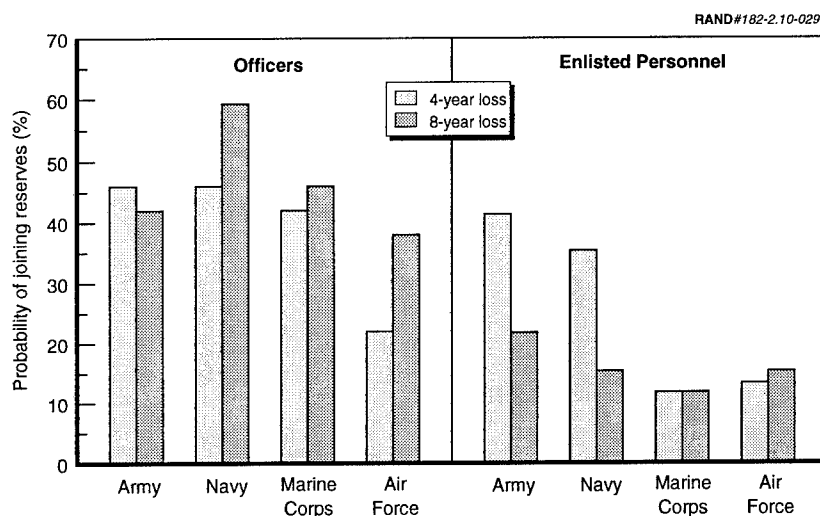


Figure 2.10—Probability of Joining the Selected Reserve by Service and Selected YOS Groups: FY84 Losses

Marine Corps enlisting only about 12 percent of their losses. Among eight-year losses, the proportions regained were much smaller for the Army (20 percent) and for the Navy (14 percent). Among Air Force and Marine Corps losses, there appeared to be little difference in the rate at which eight-year losses enter compared to four-year losses; however, the accession rate is much lower than for the Army and Navy.

One interpretation of these data is that officers find reserve positions easier than enlisted personnel do. This may be due to the lower officer active loss rates, which give the reserve a relatively smaller pool of PS officers. The Army, Navy, and Marine Corps reserve components utilize close to 45 percent of active officer losses at first term, and an even higher proportion of more experienced officer losses. However, the air components utilize only 20 percent of junior officer losses and a somewhat smaller proportion of senior officer losses than do the other services.

To provide a more general measure of the propensity to enlist in the reserve, we aggregated all losses with 4 to 15 years of service and then tracked them forward to see how many had joined the Selected Reserve by FY89. The results are shown in Figure 2.11. Among this group, Navy officers appear to be the most likely to join, with almost 60 percent entering the reserve components, followed closely by the Army (50 percent) and Marine Corps (45 percent). The Air Force ranks fourth, with only about 30 percent of its officers joining the reserve.

For enlisted personnel, the Army is currently utilizing the largest share of eligible veterans, with about 30 percent of eligible losses joining reserve components. The Navy utilizes the next largest share, with about 20 to 25 percent of eligible losses joining, while the Air Force and Marine Corps components enlist about 15 percent and 10 percent, respectively.

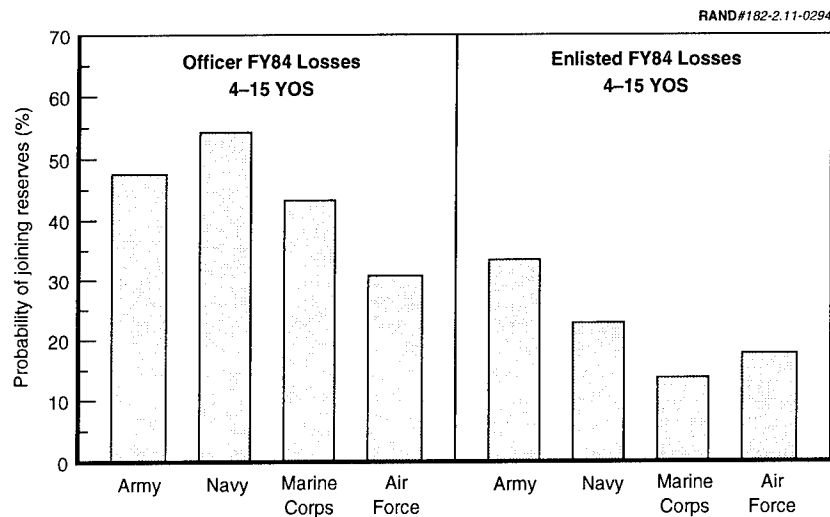


Figure 2.11—Probability of Joining Within Six Years After Separation by Service: 4-15 YOS Groups, FY84 Losses

If we assume an equal propensity among service members to join reserve components, lower enlistment rates can be due either to demand constraints or to geographic unavailability. However, the latter hypothesis cannot explain why Air Force joining rates are lower than Navy and Marine Corps rates, which have more limited geographical coverage. Geographic coverage also cannot explain differences in Air Force officer and enlisted joining rates, since presumably officer and enlisted losses are equally likely to move close to air units.

These data are consistent with the hypothesis that there exists a large queue of enlisted personnel for the air components and a smaller cushion for the officer group. For the Marine Corps, an enlisted queue is also supportable because of the wide disparity between officer and enlisted rates that cannot be attributed to geographic scarcity. The Navy rates indicate no support for officer queues, but perhaps a limited queue of enlisted personnel. The Army appears to be operating close to supply-constrained levels for both officers and enlisted personnel, but may also have some queues of more-senior enlisted PS personnel, given that enlistment rates are much lower for more-senior losses.

Loss Rates for Reserve PS Personnel

High loss rates for PS reserve personnel make it more difficult to maintain high proportions of PS personnel in reserve forces. The reserve forces could compensate for smaller active force sizes and fewer PS accessions if they could reduce PS loss rates. Figures 2.12 and 2.13 compare the PS and NPS continuation rates by years of

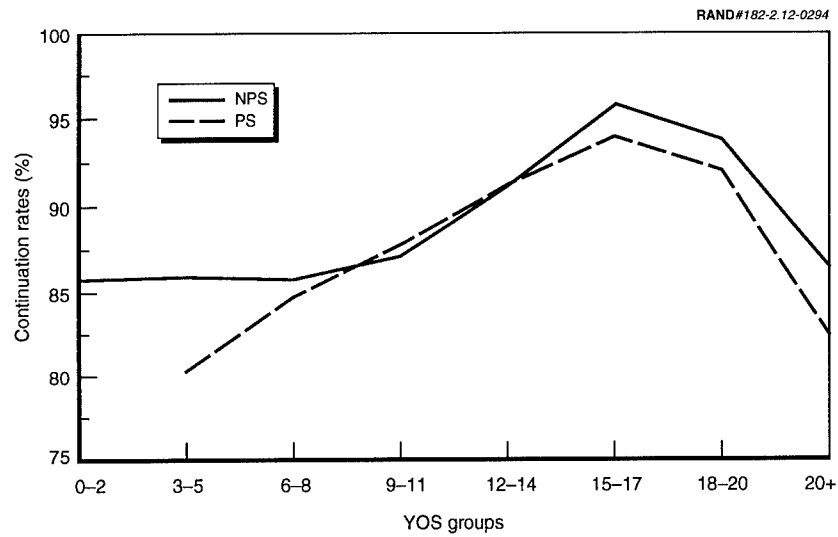


Figure 2.12—Continuation Rates for PS and NPS Officers by YOS Groups in FY89

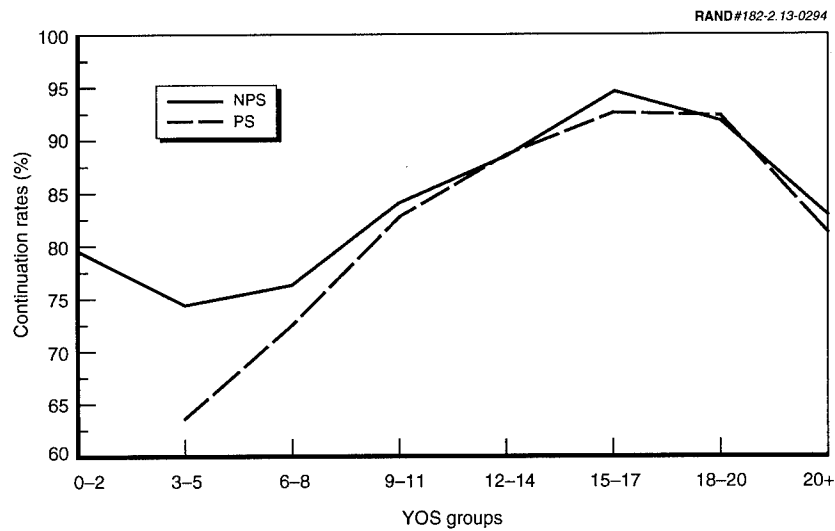


Figure 2.13—Continuation Rates for PS and NPS Enlisted Personnel by YOS Groups in FY89

service for all officers and enlisted personnel.⁸ PS continuation rates are equal to or lower than NPS separation rates at similar years of service. This holds true for both officers and enlisted personnel, although officers have higher continuation rates than enlisted personnel. PS separation rates are particularly high in the first years of joining. Part of this is due to more frequent civilian job and location changes during the initial years after active service. However, part may also be due to organizational and training quality in the components.

It is clear that these separation rates vary significantly across components and by type of personnel (Figure 2.14). The air components have significantly lower separation rates than other components for both officer and enlisted personnel, while the USMCR and USNR have the highest separation rates. The latter components have two to three times the separation rates of the air components. This means that—all other things being equal—their demand for PS accessions also is higher by a factor of two or three because of their high separation rates. These higher separation rates mean that the USNR and USMCR forfeit much of the advantage gained by larger active-reserve ratios in manning reserve forces.⁹

SUMMARY

The air components have the highest officer and enlisted PS content of all components. The explanation of their high PS content starts with high active-reserve

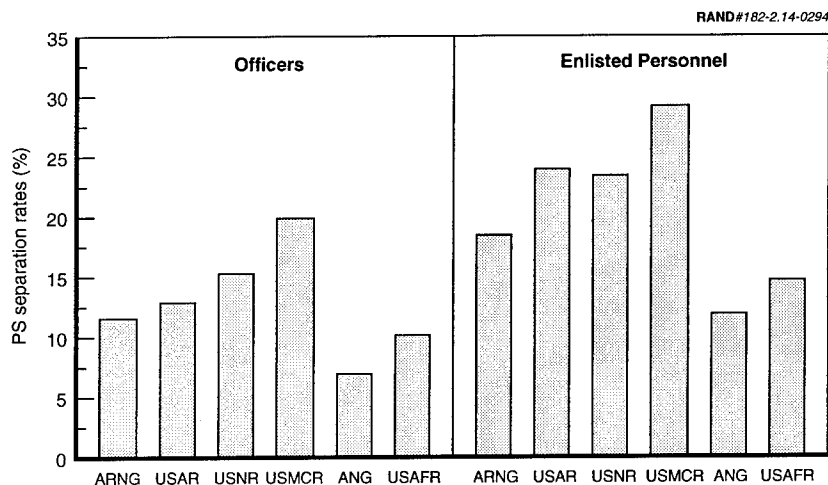


Figure 2.14—Annual Loss Rates for PS Reservists in FY89

⁸Recent analysis shows that it is important to track losses forward, because many reserve losses reenter reserve service (Kirby and Grissmer, 1993). This means that separation rates may overstate actual loss rates. However, the separation rates probably provide accurate relative loss rates across services.

⁹The higher loss rates could be in part due to time in billet limits for sea-service officers. It is typical for USNR and USMCR officers to serve at least one term in a voluntary training unit in IRR status as a result of this practice.

ratios. The active force provides a large base of trained personnel relative to reserve force demands. The air reserve components also have among the lowest loss rates for their reserve personnel, and this means that fewer PS accessions are needed to maintain a given level. In addition, the air components have among the lowest demands for junior personnel.

The present high PS content of the Air Force does not tell the whole story, because it also appears that they are not utilizing all PS personnel willing to join. They enlist a significantly lower share of active losses than other components, so reductions in active force size may not reduce PS content, but merely reduce the queue of individuals waiting to join.

The USNR has the next highest proportion of PS personnel. The Navy also starts with very favorable active-reserve ratios and maintains a PS content of between 55 and 65 percent for part-time officers and enlisted personnel.¹⁰ However, despite a very favorable active-reserve mix, they attract among the highest shares of officers and a much higher share of enlisted personnel than the air or Marine components to maintain this PS content. This large share is partly driven by very high reserve loss rates.

The Marine Corps Reserve has a PS officer content as high as the USNR but an enlisted content that is by far the lowest of all components. The officer content is explained partly by the high ratio of active to enlisted officer positions. Despite this advantage, the Marine reserve has to enlist a high proportion of active officer losses—partly because of high reserve officer loss rates. There appears to be no queue of Marine officers, since the corps accesses such a high proportion of its active losses.

The PS content of the Marine Corps enlisted force appears to be driven by the types of positions available and by preference. The Marine Corps' reserve force is primarily infantry units, which provide a high percentage of junior personnel. The Marines prefer to take NPS personnel to fill junior positions rather than recruit more PS personnel. Currently, a far smaller proportion of active enlisted losses than officer losses enter the reserve. This may be an indication that more PS personnel are available.

The Army has the lowest PS content for officers, and exceeds only the Marines on the enlisted side. The Army currently utilizes the largest share of active enlisted losses and nearly the largest share of active officer losses to maintain even these low levels of PS content. This is largely explained by the small ratio of active to reserve forces, although part of the low PS content may be driven by low grade structures for their units. The Army tries to maintain by far the largest reserve component with respect to active force size of any component. The active force simply does not produce sufficient losses to sustain a high PS content in the Army reserve components.

¹⁰See earlier footnote on data inconsistencies for USNR and USMCR. The actual PS content for these two reserve components may be much higher than reported here.

PROJECTING FUTURE PS CONTENT

This chapter describes the methodology used in evaluating the effects of force downsizing and restructuring on the long-term PS content of the Selected Reserve Forces and the results of that analysis. The officer and enlisted force of each component are evaluated separately. The separate treatment is necessary, because the reduction in active-force size, the projected size of reserve forces, and the dependence on prior active service personnel are all very different across components and across officer and enlisted ranks.

The evaluation focuses mainly on the longer-term PS content for two reasons: First, the active-force downsizing will lead to a temporary sizable increase in veterans. This short-term increase will temporarily mask the long-term significant decline in the PS pool and may lead to misleading conclusions about future sustainability. Second, the main utilization of PS personnel is in the mid- to senior-level positions. It will take years for reduced PS accessions to show up as reductions in the more senior positions, and if this situation occurs, it will be virtually irreversible. A short-term analysis is likely to miss this decrease, which may have important implications for future reserve-force personnel readiness.

Our analysis will focus on the changes in PS content of the part-time force only, for two reasons: The active-force reduction will primarily impact the composition of the part-time force. The full-time force is not only more stable, but it is demand constrained. The active-force reduction will likely have little impact on its PS composition. Secondly, the PS distinction is much less important for full-time personnel because of their greater experience in their jobs.

MODELS AND ASSUMPTIONS

Figure 3.1 shows a schematic of the modeling process used to project the PS content of each reserve component. We start with dynamic active force models that project future losses, accessions, and inventories of active personnel disaggregated into 220 groups. These groups are by year of service (YOS), gender, race, education, and aptitude. We assume a specific active-force drawdown scenario from FY93–97 and maintain constant active-force size thereafter. We use the average of FY87–89 continuation rates for those years and groups unaffected by the drawdown.

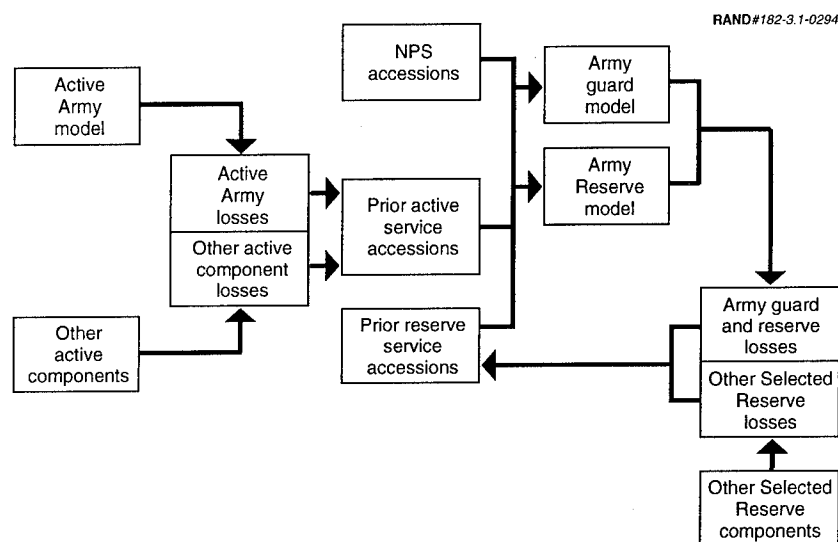


Figure 3.1—Flow Diagram for Single Service

This model provides the PS pool of veterans by year of service for each service. We then utilize transition rates by year of service and years since active separation to generate the prior active service accessions. Reserve inventory projection models (Kawata, Grissmer, and Eisenman, 1989) are used to project losses, accessions, and inventories for the reserve component.

These inventories are disaggregated by years of service. Separate inventories, losses, and accessions are maintained for both PS and NPS personnel. We assume FY89 continuation rates to project these reserve inventories. The model includes provision for reserve personnel reentering any component of reserve service. These prior reserve service accessions constitute an important part of reserve accessions.

We assume in the models that prior active service accessions are the “first choice” accessions—that they are taken in before NPS accessions or prior reserve accessions. The availability of PS accessions is determined by the pool of active losses and by assumptions made in setting the transition rates of active losses into reserve service. For each service, we have made two assumptions to attempt to bound the transition probabilities. The lower bound is set by historical rates of transition by year of service. These rates use the joining rates of each active loss cohort from FY80 to FY92 by year of service. We set the rates based on more-recent data where there are distinct trends. The higher transition rates are set in two ways: For the components that are currently near their supply constraints, we arbitrarily increase the transition probability by 15 percent to account for incentive programs that might increase PS participation and the unlikely event of demand constraints in prior historical data. For the components that are demand constrained, we assume a higher level of propensity based on the similar propensity of the other non-demand-constrained services. For instance, we assume that their joining rate could rise to the Army rate if positions were available.

We also make the following assumptions:

- The proportion of full-time reserve personnel remains the same as in the current force, so our analysis focuses on the inventory of part-time reserve personnel.
- Downsizing is completed by FY97.
- Active downsizing is done with a combination of accession reductions, voluntary separation programs, and early retirement.
- Reserve downsizing relies primarily on accession reductions, and PS personnel are given priority over NPS personnel in terms of accessions. This means that PS personnel are recruited to the limits of supply before NPS personnel are recruited.
- The proportional split between the guard and reserve in both the Army and the Air Force reserve components is held constant at the FY89 level.

Based on these assumptions, we track changes in the PS inventory from FY92 to FY2010. We utilize several “bounding” scenarios that set active and reserve force size at limits currently used in RAND’s Force Mix Study (National Defense Research Institute, 1992).

Army National Guard and Army Reserve

Scenarios. Figures 3.2 and 3.3 show the combination of active, guard, and reserve steady-state end strengths for the 12 scenarios we have projected for the Army (six for officers and six for enlisted personnel). Two sizes of active end strengths were used, corresponding to active Army sizes of 456,000 (referred to as LoAC) and 532,000 (HiAC). For each of these active scenarios, three reserve end-strength combinations

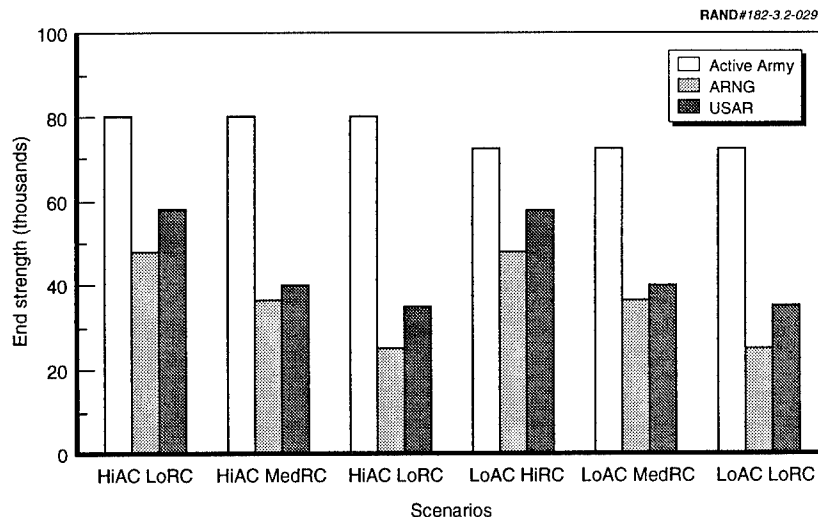


Figure 3.2—Six Active-Reserve End Strength Scenarios: Army Officers

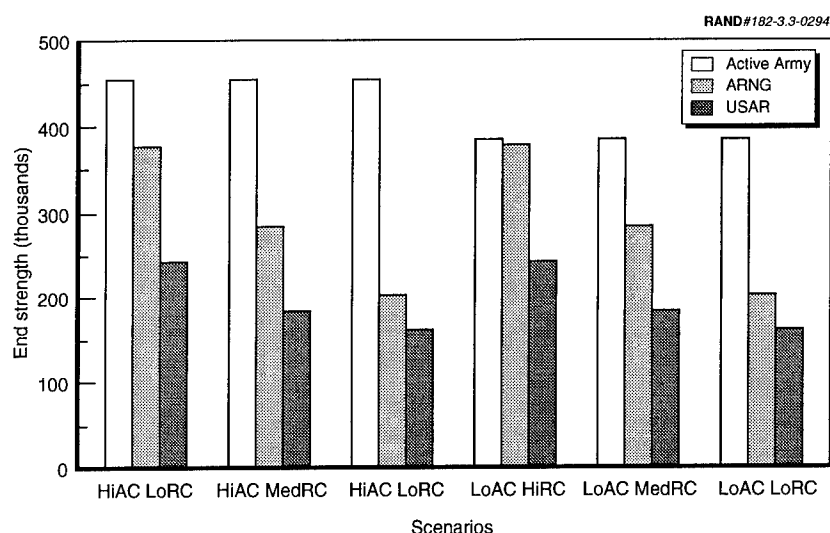


Figure 3.3—Six Active-Reserve End Strength Scenarios: Army Enlisted Personnel

were projected, corresponding to total strengths of the two components of 421,000 (LoRC); 542,000 (MedRC); and 725,000 (HiRC). For each of these six active and reserve combinations, we used two propensities for active veterans to enlist in the reserve components. The first corresponds to recent historical data and is labeled Lo P. The second propensity is 15 percent above Lo P and is called Hi P. The Army components are currently enlisting the highest proportion of enlisted loss cohorts and nearly the highest officer loss cohorts. We believe that current conditions reflected by Lo P are at or very near supply-constrained levels for current compensation levels. The 15-percent increase in the Hi P could include some level of demand constraint or reflect increases that could be obtained with increased recruiting and strong additional incentives.

Results—ARNG Officers. We first present the estimated prior active service inventory proportions for the 12 scenarios specified above. Figure 3.4 shows our estimated prior active service percentage in the inventories of officers in 2010. The figure also shows the PS percentage in the FY89 inventory. The data show that only one scenario maintains the present PS inventory.

This is the most optimistic case when active force size is largest (HiAC), reserve force size is smallest (RC = 250,000) and the probability of joining is highest (Hi P). The largest RC scenario results in substantial reductions in PS inventory to levels of 23 to 25 percent. All current scenarios fall far short of the congressional goal of 65 percent.

Enlisted. Figure 3.5 shows the projection results for enlisted ARNG personnel. Only under the most optimistic scenario is the ARNG able to maintain FY89 PS inventories. The highest inventory is 36 percent prior service, compared to FY89 levels of 34 percent. The other 11 scenarios all result in declines in PS proportions. The scenarios of largest RC force sizes would drive PS enlisted inventories to around 20 percent.

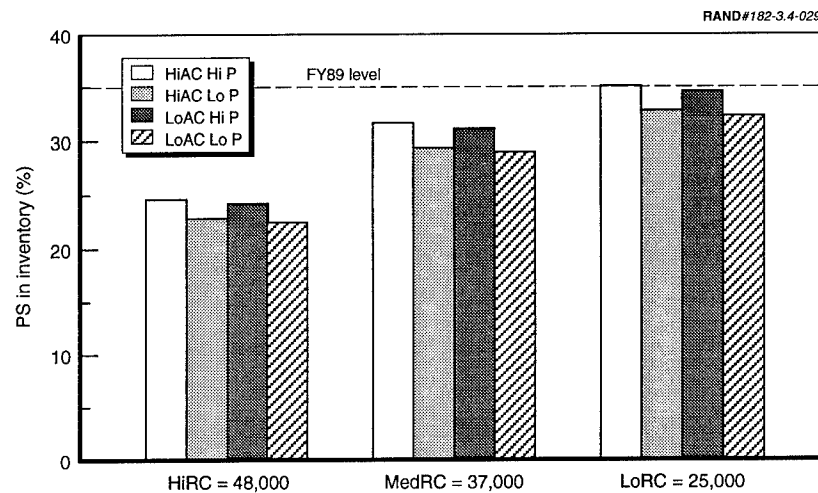


Figure 3.4—Percentage Prior Service in Inventory, FY2010: ARNG Officers

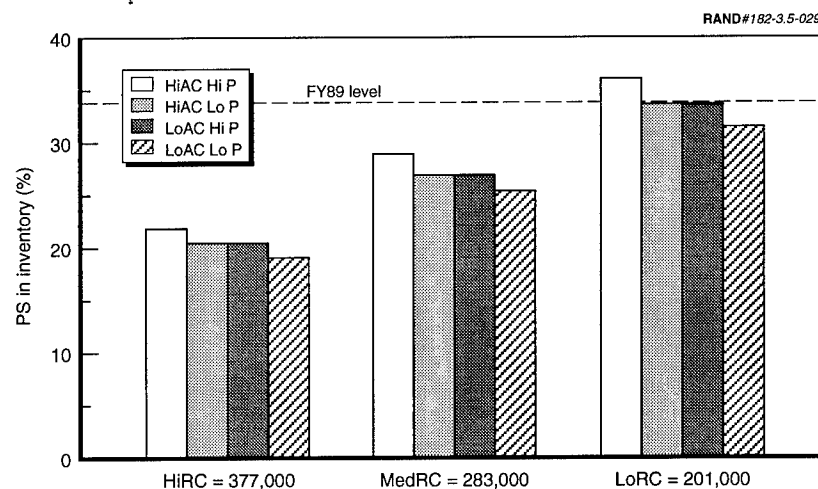


Figure 3.5—Percentage Prior Service in Inventory, FY2010: ARNG Enlisted Personnel

All scenarios fall short of the congressionally mandated 50 percent.

Results—USAR Officers. The projection results (Figure 3.6) for the USAR officers show that present inventories could be maintained and slightly exceeded for moderate and low USAR sizes. The present PS inventory is 53 percent, and the projections show that this level is exceeded under the most pessimistic scenarios of active size and propensity to enlist if the size of the USAR officer corps is reduced to 40,000 or below. Increasing the officer corps to 58,000 results in significant declines in PS inventory to less than 50 percent.

Enlisted. Among the enlisted, the data (see Figure 3.7) show four of the scenarios exceed present inventories of 37 percent. Under the most optimistic scenario, we get a

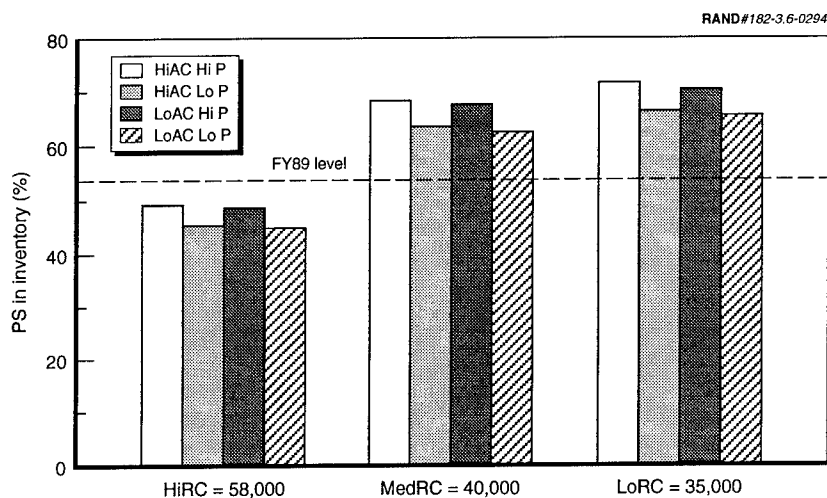


Figure 3.6—Percentage Prior Service in Inventory, FY2010: USAR Officers

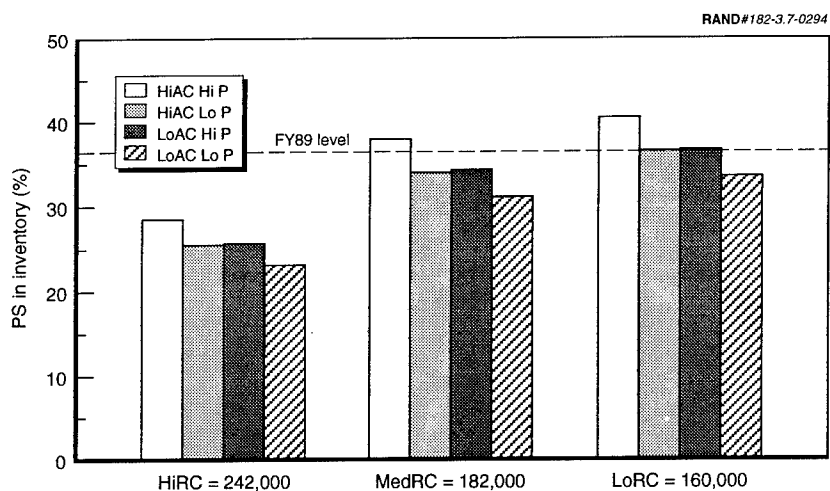


Figure 3.7—Percentage Prior Service in Inventory, FY2010: USAR Enlisted Personnel

PS inventory of 40 percent. Under high reserve-force sizes, the PS percentages decline to around 25 percent.

Navy

Scenarios. The end strength scenarios for Navy officer and enlisted personnel for active and reserve forces are shown in Figures 3.8 and 3.9. The scenarios cover two different active end strengths of 491,000 (HiAC) and 454,000 (LoAC) and three very wide-ranging reserve end strength options, with the highest being 122,000 (HiRC) and the lowest 55,000 (LoRC).

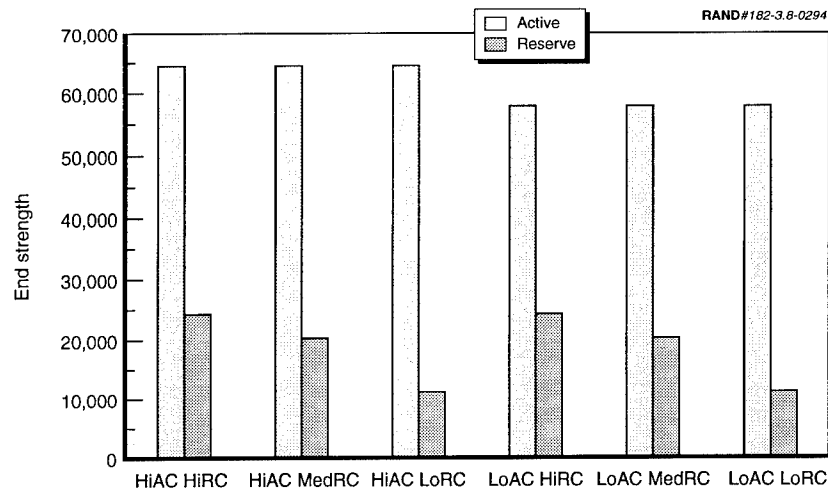


Figure 3.8—Six Active-Reserve End Strength Scenarios: Navy Officers

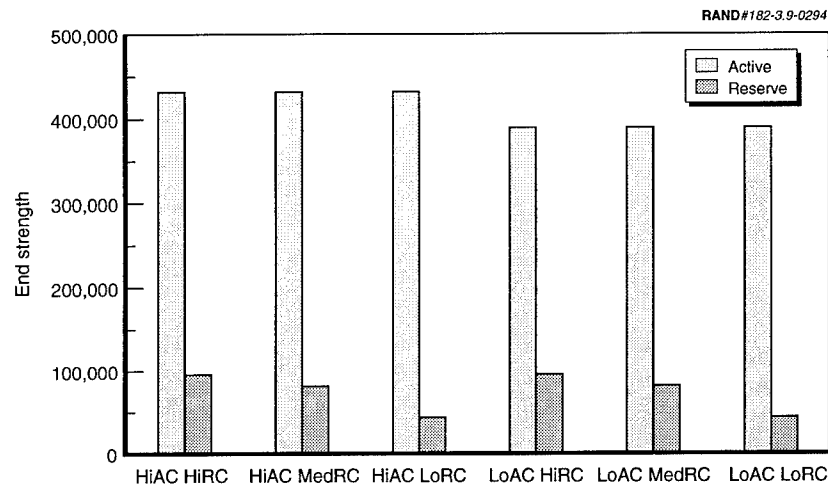


Figure 3.9—Six Active-Reserve End Strength Scenarios: Navy Enlisted Personnel

Results—Officers. Naval Reserve officers had a PS content of 62 percent in FY89.¹ The results (Figure 3.10) show that, under the low propensity to enlist option, PS content would fall to between 55 and 60 percent under the two more stringent active-reserve scenarios, where reserve-force size is largest, but would remain the same or go higher under the medium and low reserve-force strengths. The 15-percent higher propensity shows that the officer corps could have a higher PS content than FY89 in each scenario. However, the higher enlistment probability is unlikely without major

¹As pointed out earlier, this may be an underestimate because of data problems. Nonetheless, the change in PS content over time is still accurate.

changes in incentives for the Navy, since the Navy currently enlists the largest proportion of active officers of any service—almost 60 percent from the FY84 cohort.

Enlisted. The results for the Navy enlisted personnel, also shown in Figure 3.10, show similar patterns as for officers. The two high reserve-force size scenarios under a low propensity to enlist show a decline in prior active service percentage from the FY89 level of 53 percent to as low as 42 percent. The other four scenarios of moderate and low reserve force sizes show equal or higher PS content. In the low options, the PS percentage rises as high as 75 percent. Under the higher-propensity option, only two scenarios fall below current levels. However, the 15-percent higher propensity may also be unlikely for Navy enlisted personnel without new strong incentives. The USNR currently takes in the second highest proportion of active veterans and probably is at or near supply constraints.

Marine Corps

Scenarios. The analysis of the Marine Corps uses ten different force size and mix options (see Figures 3.11 and 3.12) that correspond to four different active-force sizes and ten different USMCR sizes. The active-force sizes correspond to force structures of 4, 3.5, 3, and 2.5 Marine Expeditionary Forces (MEF). Within these options, there are two reserve-force sizes for the 4, 3.5, and 2.5 MEF options and four reserve-force sizes for the 3 MEF option. The variation in active- and reserve-force sizes are quite large. Active-force size ranges from 180,000 to 128,000 and reserve-force size ranges from 78,000 to 23,000.

Results—Officers. The results, shown in Figure 3.13, are quite different for officers and enlisted personnel. For officers, most scenarios show a decline in prior active

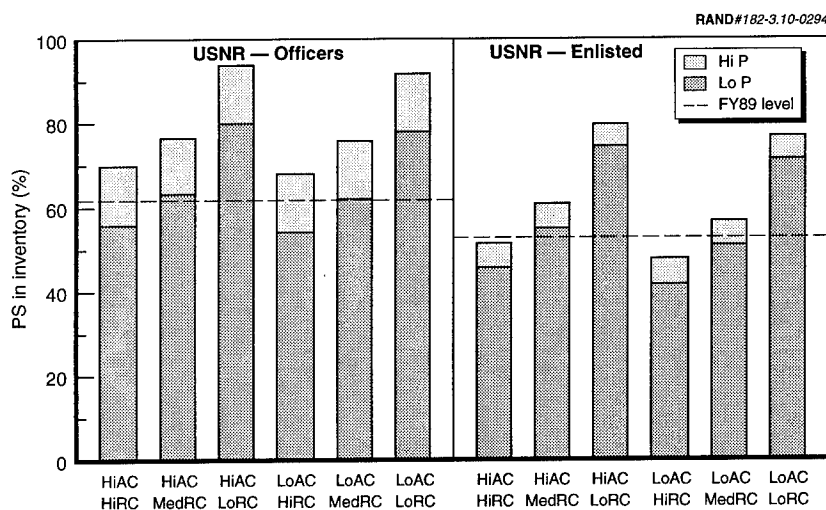


Figure 3.10—Percentage Prior Service in Inventory, FY2010: USNR Officers and Enlisted Personnel

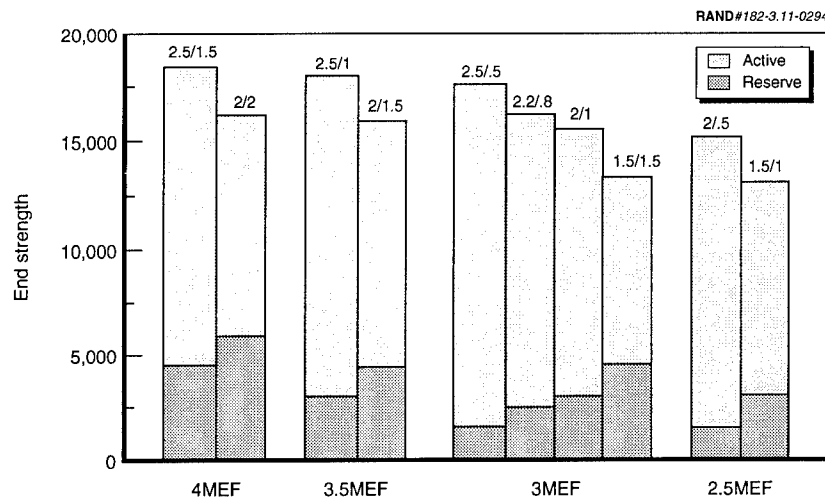


Figure 3.11—Six Active-Reserve End Strength Scenarios: Marine Corps Officers

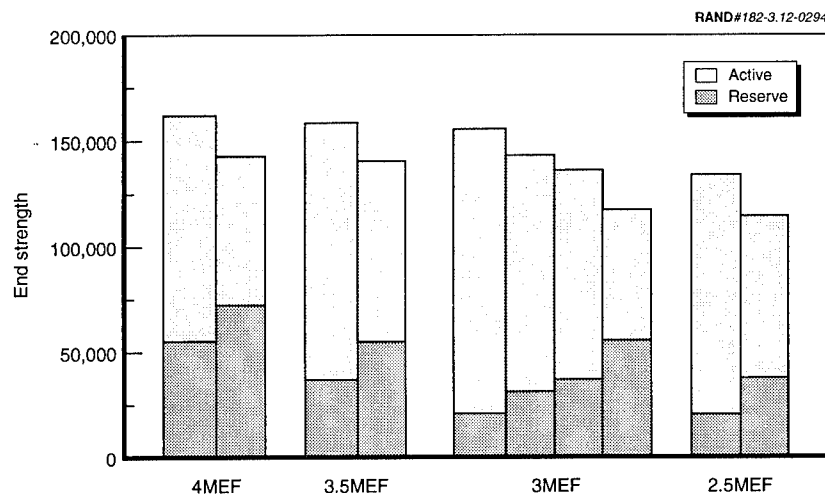


Figure 3.12—Six Active-Reserve End Strength Scenarios: Marine Corps Enlisted Personnel

service percentage from the level of 62 percent in FY89.² The worst case is the 4MEF scenario, in which two MEFs are active and two are reserve. The prior active service percentage would be less than 40 percent under this scenario. Under most scenarios, Marine officers would meet the ARNG congressional limit of 65 percent. There is little difference between the high and low propensity scenarios, because the USMCR currently takes the largest portion of its active officer losses. It would be very difficult

²As pointed out earlier, this may be an underestimate because of data problems. Nonetheless, the change in PS content over time is still accurate.

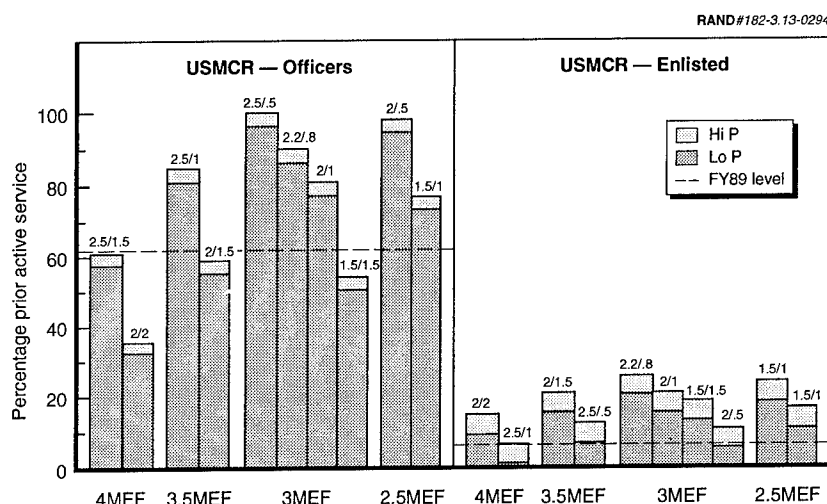


Figure 3.13—Percentage Prior Service in Inventory in FY2010:
USMCR Officers and Enlisted Personnel

to expand this proportion, given the limited geographical coverage of USMCR units and the high proportion currently enlisting.

Enlisted. The USMCR has the lowest level of prior active service of any component—about 10 percent in FY89. This is largely a matter of deliberate policy. The Marines take the smallest proportion of active enlisted losses of any component and could probably expand this somewhat without changes in policy. With current policy in place and assuming the historical enlistment rate for active losses (Lo P), most of the scenarios show higher PS percentages. Under 30-percent higher propensity option, the PS percentage only increases to 15 to 20 percent for most options. Part of the reason for the difficulty in raising PS rates is the high loss rates for USMCR enlisted personnel. Almost 30 percent of prior active service personnel separated in FY89—the highest separation rate by far of any component. Taking in more PS personnel is effective only if they stay. The USMCR enlisted personnel are very far from the 50-percent goal set by Congress for the ARNG. It would be nearly impossible even under the lowest reserve-force sizes to reach these limits without major policy changes that would reduce loss rates and increase joining rates.

Air National Guard and Air Force Reserve

Results—Officers. Figure 3.14 shows the force-size options used for the Air Force scenarios. Figure 3.15 shows the projected PS inventory for ANG and USAFR officers under these scenarios. The low-propensity projections were based on historical joining rates, which we believe are demand constrained. The high-propensity projections assumed that Air Force officers would join at rates just below those of Army officers. This level is about 50 percent higher than current levels. The projections show that ANG and USAFR prior active service levels could fall if current joining rates are assumed. However, under the assumption of higher joining rates more consis-

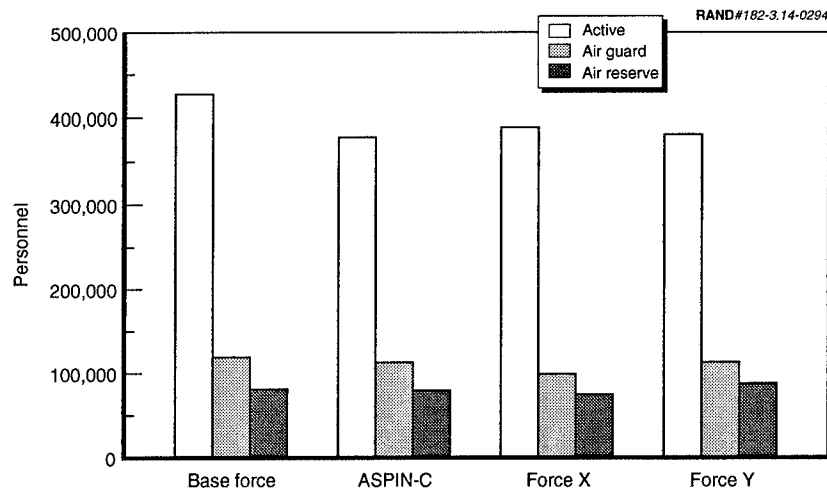


Figure 3.14—Air Force Sizing Scenarios

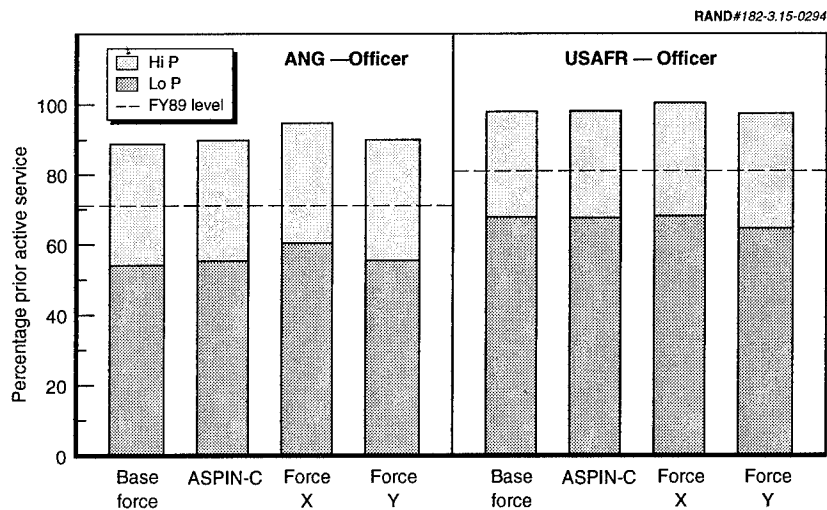


Figure 3.15—Projected Percentage Prior Service in Officer Inventory in 2010

tent with Army rates, the PS levels all exceed current levels. Air component joining rates may not reach Army rates because of more limited geographical availability and perhaps the different skill mix and grade structure of the reserve. So actual supply-constrained joining rates may be constrained somewhat below these high levels.

Enlisted. Figure 3.16 shows the projected results for enlisted personnel. Here, all results show deterioration of PS levels under the low-propensity scenario. However, the high-propensity options show stable levels in the ANG, but lower than levels in FY89 for the USAFR. ANG levels are shown to decline from about 53 percent in FY 1989 to levels of almost 40 percent under the low-propensity scenarios. For the

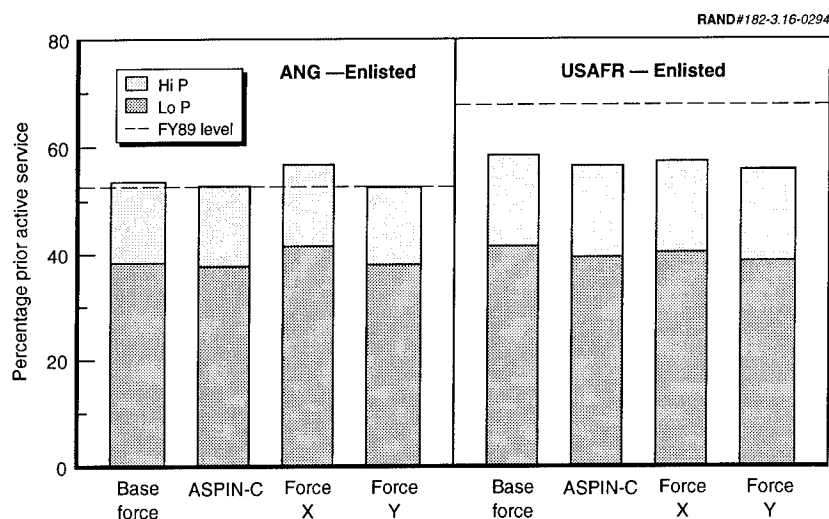


Figure 3.16—Projected Percentage Prior Service in Enlisted Inventory in 2010

USAFR, the reduction is from levels just under 70 percent to just below 40 percent for the low-propensity option. Under the high-propensity options, the USAFR loses about 10 percentage points from its PS percentage, while the ANG maintains a stable level.

SUMMARY

The effect of the drawdown on PS content will affect each component and its officers and enlisted personnel differently. The Army components would—in the absence of policy changes—be the most vulnerable. The Army components currently utilize among the highest percentages of both officer and enlisted active losses, and this probably indicates current supply constraints. The active Army will probably suffer proportionately larger cuts than the other services, and its reserve components will probably not be cut proportionately. Thus, the Army will move to an active-reserve ratio even smaller than the current ratio of 1:1, and our projections show fairly significant further declines in PS content for the ARNG and USAR. Since both start from relatively low levels, further declines raise concerns about future readiness.

The air components will probably see the least change in content—partly because they do not currently appear to utilize a significant share of the PS officers and enlisted personnel willing to join. Current plans for cutting the active Air Force show smaller cuts than the Army, and the size of its reserve components will probably stay at current levels. Even though this lowers its active-reserve ratio, the likely effect will be simply to enlist a larger proportion of the willing Air Force pool.

Both the Navy and Marine Corps reserves are enlisting among the largest share of officers of any component and are probably at supply-constrained levels. Current plans call for smaller percentage cuts in these active components than in the Air Force or Army. If reserve components do not decline proportionately, both may

have trouble maintaining their current officer percentages. The size of the decline would depend on where active- and reserve-force sizes finally settle.

For the enlisted force, the USMC and Naval Reserve currently do not utilize all who are willing to join. The USMCR currently utilizes the smallest proportion of active enlisted veterans, which indicates a potentially large queue. If its preference continues to be to utilize NPS personnel for nearly all lower-level positions, it will probably be able to maintain its PS content at current levels, even with an active drawdown, while maintaining reserve-force size. So the drawdown will probably not appreciably affect the Marine reserve enlisted force. The apparent queue of naval enlisted veterans is likely smaller than the Marine queue, so it would not provide quite as large a cushion against active-force cuts, but could absorb some cuts without lowering PS content.

In general, the services are utilizing a higher proportion of officer active losses than enlisted losses, and the Army, Navy, and Marine Corps all utilize what appears to be close to a supply-constrained level for officers. However, only the Army appears to be close to supply constraints for enlisted personnel. So the PS content among officers may be more vulnerable to drawdown than it is among enlisted levels.

DIFFERENCES BETWEEN PS AND NPS PERSONNEL

How important are the potential declines in PS personnel? The importance depends on the answers to the following two questions:

- How critical are PS personnel to reserve readiness?
- How effective can changing personnel and compensation policies be in closing any PS gap that develops?

Neither of these questions can be satisfactorily answered without much further research. The purpose of the following four chapters is to start this research process and to identify the important research questions and issues that should shape the future research agenda in this area.

Little direct research has been undertaken on the question of the contribution of PS personnel to reserve readiness. In this and the next two chapters, we ask three important questions concerning PS contributions to readiness and identify the gaps in the current research:

- What are the important differences between PS and NPS reservists that may affect personnel readiness (Chapter Four)?
- How are PS and NPS personnel utilized differently, and what are the implications for possible substitution (Chapter Five)?
- How would reduced PS content affect future readiness problems (Chapter Six)?

Finally, in Chapter Seven, we identify personnel and compensation policies that would be directed toward maintaining or boosting PS content and outline the research required to further shape an effective set of initiatives.

MEASURES OF DIFFERENCE BETWEEN PS AND NPS RESERVE PERSONNEL

One initial research issue is to determine the important changes in personnel characteristics that would occur if more substitution of NPS personnel for PS personnel occurred. When reserve units deploy, their performance will depend partly on the characteristics of individuals in the units, their levels and types of military and civilian experience, and partly on the quality of training of the unit.

Changing active- and reserve-force sizes can result in long-term changes in the mix of PS and NPS personnel, and this substitution will change the characteristics of reserve personnel and the level of civilian and military experience. We compare below key characteristics of PS and NPS personnel in FY89 using active personnel characteristics as a comparative benchmark.

Education and Aptitude

Education and aptitude are the two main measures of the potential trainability and performance of enlisted recruits. Research on early enlisted active and reserve attrition during training and prior to completing a term of service has shown higher education and aptitude to predict higher first-term completion (Buddin, 1984; Buddin, 1988; Grissmer and Kirby, 1985; Grissmer and Kirby, 1988; Marquis and Kirby, 1989; Kirby and Grissmer, 1992; Hosek, Antel, and Peterson, 1989; Klein and Hawes-Dawson, 1991). Since much first-term attrition is connected in some way to unsatisfactory training or job performance or nonjob behavior problems, these measures also indirectly predict job productivity and performance. In addition, research on promotion rates shows that higher education and aptitude predict faster promotion among enlisted personnel (Ward and Tan, 1985; Buddin, 1993). To the extent that promotion depends on job performance, these results also indicate that education and aptitude are important measures. Finally, direct studies of training success, job knowledge, and actual performance of enlisted personnel show aptitude and education to be important predictors (Horne, 1987; Scribner et al., 1986).

The Armed Forces Qualification Test (AFQT) is used to determine aptitude only for enlisted personnel. So, for officers, we present only educational attainment. Both high school graduation and scores on the AFQT aptitude tests are presented for the enlisted force.

Figure 4.1 shows the college graduate percentages for active personnel and for PS and NPS reservists. The educational level of the officer corps of all active components is very high—90 percent or higher, and nearly all Army and Air Force officers have college degrees. The Army National Guard percentages are the lowest of the reserve components, with 52 percent of NPS officers and 62 percent of PS officers having college degrees.¹ Since all active Army officers have college degrees, the lower percentage of PS officers having degrees is somewhat surprising. One explanation for this percentage for PS officers is individuals who served as active enlisted personnel but were later commissioned as ARNG officers. Another explanation is that older reserve officers may have served in the active force before all officers were college graduates.

¹The policies for education requirements for ARNG and USAR officers have been tightened in recent years. For instance, the ARNG now requires a college degree for promotion to the rank of captain. These policies will probably gradually raise the educational level of ARNG and USAR officers. In addition, the Army obtains many NPS officers directly through ROTC programs without active service.

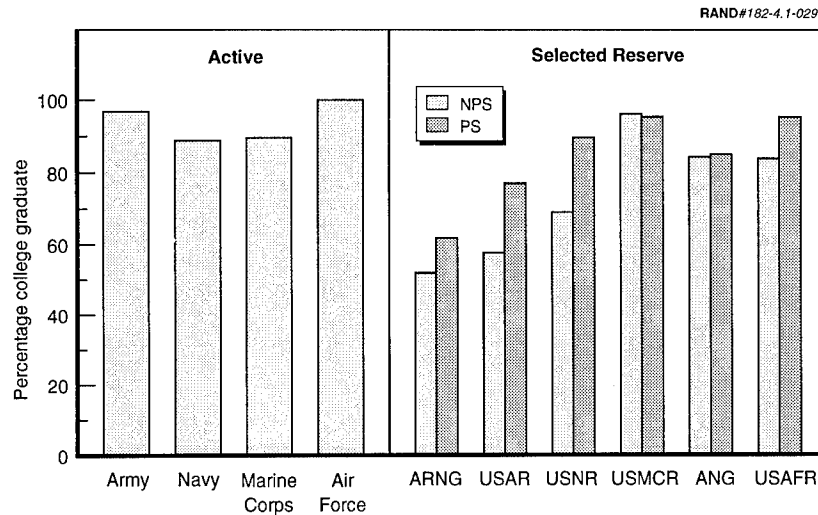


Figure 4.1—Educational Attainment of Active and Reserve Officers in FY89

The USAR has somewhat higher percentages than the ARNG, but also reveals a much higher percentage of NPS officers than PS officers with no college degree. The Navy and Air Force also show lower college graduation rates among NPS officers, but with PS rates much closer to active rates than the Army components have. The Marine Reserve shows very high levels of college graduation for both active and reserve officer personnel.

For the enlisted force, Figure 4.2 shows that both the active and reserve forces recruit high percentages of high school graduates. In the Army Reserve components, there is a slightly smaller percentage of high school graduates among NPS personnel, but

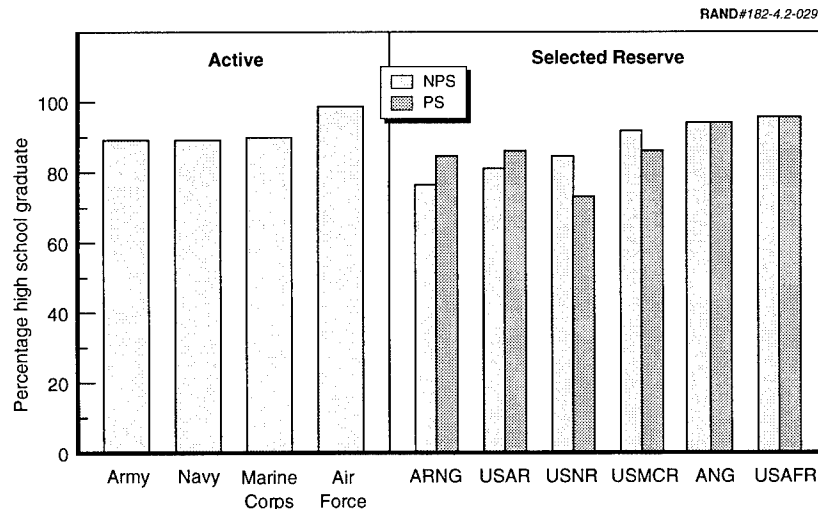


Figure 4.2—Comparison of Active and Reserve Enlisted Personnel by Educational Levels in FY89

the other components are able to maintain NPS graduation rates that are equal or greater than those for PS personnel.

Generally, the services attempt to draw as many of their recruits as possible from individuals scoring in the higher categories of the aptitude test. Here, we focus on the percentage of recruits scoring 65 or higher—generally referred to as Category I–IIIA recruits. Figure 4.3 compares the active and reserve component personnel in terms of this percentage. In FY89 the ARNG personnel had about 40 percent of NPS and 46 percent of PS personnel from the higher aptitude categories, compared to 50 percent for the active.

The corresponding numbers for the USAR show 47 percent NPS and 55 percent PS personnel from higher aptitude categories.

The Naval and Marine components show a significant gap between NPS and PS personnel, with PS personnel having a much lower aptitude. Their NPS personnel are only slightly less likely to come from higher-aptitude groups than their active counterparts, but the PS personnel appear to come more often from the lower-aptitude distribution of active personnel. The Air Force has the largest percentage of higher-aptitude personnel among both active and reserve personnel, with a slight tendency for NPS personnel to come from higher-aptitude groups than PS personnel. Part of the reason that NPS personnel show higher aptitudes than PS personnel for the Navy and Air Force is that they recruit far fewer NPS personnel than the Army, and thus can afford to be very selective.

Further research is needed to determine how these education levels and aptitudes might shift as the active sizes get smaller and as the reserves recruit more NPS personnel. Smaller active size may bring higher-quality recruits and perhaps also higher-quality losses. So, although there may be fewer PS personnel, their quality may actually increase. Recruiting more NPS personnel by the reserve would—all

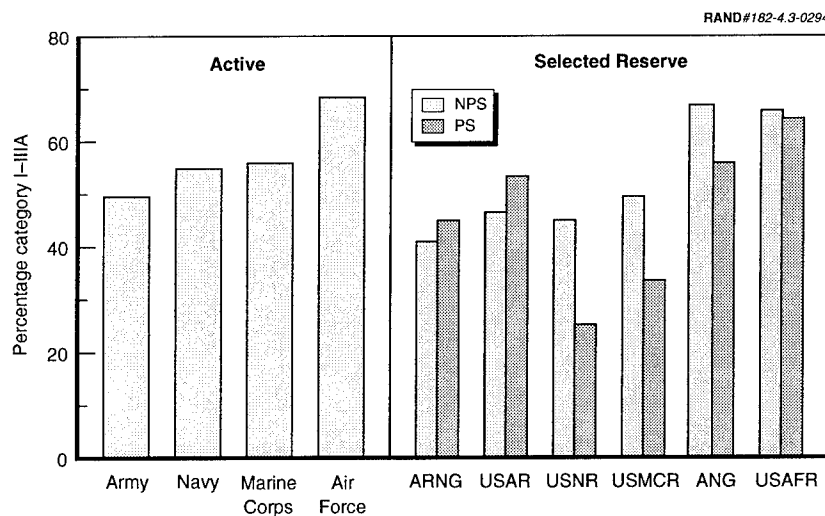


Figure 4.3—Comparison of Active and Reserve Enlisted Personnel by Aptitude Category in FY89

other things being equal—be expected to diminish the quality if NPS personnel are supply constrained. However, the reserve components that currently recruit few, but very high quality, NPS personnel (Navy and Air Force) may have queues and could increase recruiting with little diminution in quality. On the other hand, large increases in recruiting by the Army components might be expected to lead to lower quality among NPS personnel. A counter scenario might be that reduced active-force recruiting could actually enhance reserve-force recruiting as individuals who formerly entered active service turned to reserve service instead. Little is currently known about the degree of substitution of reserve for active service under reduced active recruiting conditions (see Tan, 1991).

Military Experience: Traditional Measures

The most obvious difference between PS and NPS personnel is their level and type of military experience. Job proficiency is gained through on-the-job training and performance. All other things being equal, job proficiency increases with job experience.

We present two simple initial measures of military experience and use them to compare PS and NPS personnel across components. Neither measure is entirely satisfactory, and we describe how future research can improve these measures to make them better indicators of job proficiency.

The commonly used aggregate measure of military experience for active personnel is simply years of service (YOS). A similar measure that military personnel reports² use for reserve personnel counts the sum of active and reserve years of service. Figures 4.4 and 4.5 show the average experience of the officers and enlisted personnel in both the active and reserve components as counted by this measure.

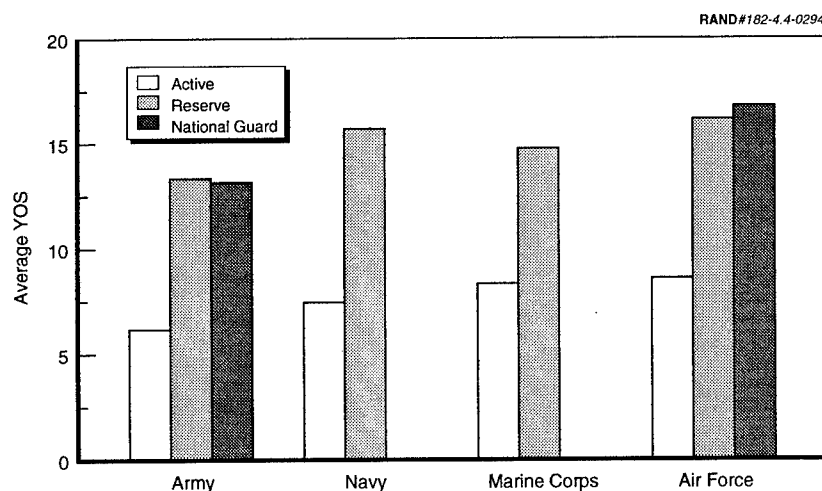


Figure 4.4—Average Years of Service: Active and Reserve Officers, FY89

²See, for instance, the monthly reports the Defense Manpower Data Center in Monterey, California, issues on the Reserve Components Common Personnel Data System.

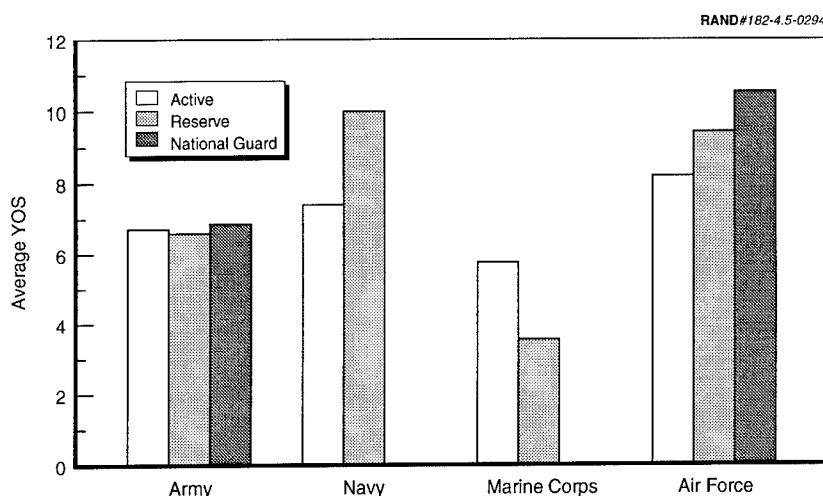


Figure 4.5—Average Years of Service: Active and Reserve Enlisted Personnel, FY89

By this measure, the reserves appear to have very experienced personnel, far more experienced in many cases than the active force. For example, the average YOS of active Army officers is 6.2 years, compared to a little over 13 years in the two Army reserve components. Similarly, the average YOS of Air Force officers is almost half that of the two air reserve components. Among enlisted personnel, the differences are not quite as marked, although in almost every case (the exception being the Marine Corps), the reserve components match or outpace the active components in terms of years of service.

SHORTCOMINGS OF THE TRADITIONAL MEASURES

This indicator of experience assumes that a reserve year is equal in terms of training and training opportunity to an active year. But an active component member spends a full year in the military, while the reserve member spends, on average, about 38 days.³ Clearly, the two periods of service yield different opportunities for training, and this can translate into very unequal levels of actual experience for active versus reserve members with identical years of service.

Neither active nor reserve personnel use all available time for training. Much time is consumed by administrative matters and preparation for training. Research is needed to design and collect comparable measures of training time across active and reserve components. However, perhaps as important are indicators that would measure the quality of training. The active forces generally have easier access to the best training equipment or facilities and can plan training that integrates larger unit

³Many reserve members also work additional days on unit work or attending courses or providing services for the active or reserve components. We have not included these days in the full-time equivalent training year (FETY) measure, which we discuss later. However, Appendix B shows the sensitivity of the estimates of experience to assuming as high a level as 57 days. The results show that realistic amounts of additional reserve training do not significantly increase aggregate experience measures.

formations. So, measures of the quality of training may be important, as well as simple measures of time spent in training. In the absence of such data, we will present an indicator that measures training opportunity rather than actual training experience.

We assume 225 days—a normal working year after taking into account vacation, sick leave, and holidays—as representing the realistic portion of the year available for active training. If we assume that reservists have 38 days of training opportunity, the difference between the active “year” and the reserve “year” is quite large—an active year has almost six times as much training opportunity as a reserve year. We now define a measure of average experience that takes into account the relative time available to the active and reserve components for training. This measure has several shortcomings, further discussed below; nonetheless, we feel this is a first step in placing the active and reserve forces on a more comparable experience measure.

It is important to stress that the indicator presented below is illustrative rather than a definitive, final measure. As we point out below, one can argue with several of its assumptions. However, in one sense, it offers an upper-bound estimate of the *potential difference in experience* between PS and NPS personnel, because it values a reserve year at a fraction of an active year; in contrast, the YOS measure offers a lower-bound estimate of the difference in experience, because it weights reserve and active service equally. The comparisons based on our measure are meant to be suggestive rather than set in concrete. They offer, we believe, a somewhat greater insight into the differences among components in terms of potential experience than the more traditional YOS measure.

FULL-TIME EQUIVALENT TRAINING YEARS

This measure, full-time equivalent training years (FETY), focuses specifically on the amount of time available for practicing military skills and on the different kinds of personnel in the reserve for whom this available time differs. The measure requires different calculations depending on whether a service member is PS, NPS, or a full-time member of the reserves. The standard of comparison is the active-duty member who gets credit of one year for each year of active service performed, where one year is equal to 225 days. Other categories are computed as shown below.

PS Reservists

Each year of active service counts for a full year, and each year of reserve service is given credit for 38/225 of a year. The 38 refers to the days of annual training in the reserves (normally two drill days per month and 14 days of continuous training, called annual training [AT], which normally takes place during the summer months). Thus, a PS reservist who joined the reserve with three years of active-duty experience and has served in the reserve for three years would have an FETY index of 3.51 ($3 \text{ active years} + (3 \times 38/225)$). Using the traditional measure, the active and reserve years would have been given equal weight and the individual would have a YOS of 6 years.

NPS Reservists

The calculation for a member joining the reserves directly from the civilian labor force (those with no prior military experience) is more complex. The reservist undergoes approximately eight weeks of basic military training and an Advanced Individual Training (AIT) course, which takes from one month to one year, depending on specialty. To this must be added unit drill days and AT. We used 110 days for initial active duty training (IADT) and first-year drills and annual training, although this understates the actual experience level for some high-skill specialties. Thus, the first year of an NPS reservist is given a weight of 110/225. Subsequent years are given a weight of 38/225.

Full-Time Reservists

Some reservists are full-time members; these would receive a full year of credit for every year of active service and all years of reserve service spent in full-time status. Each year of reserve service would in addition be given a weight of 38/225. Each of these types of experience is counted separately, so that a year of full-time reserve service would essentially count as *more* than one year of active service, because it would count for both “full-time” service as well as “reserve” service.⁴

Comparing Components Using FETY

To highlight the difference between the traditional measure of experience and our FETY index, in Figures 4.6 and 4.7 we present the average experience of the reserve

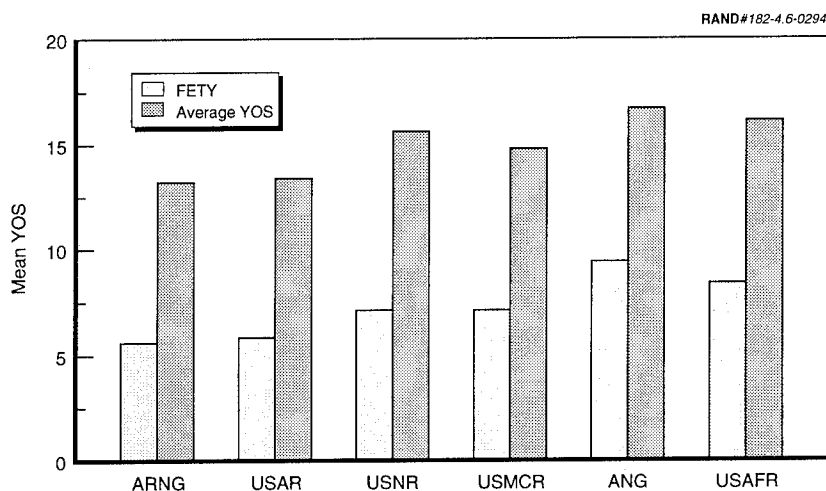


Figure 4.6—Comparison of Different Definitions of Experience: Officers, FY89

⁴This might slightly overestimate FETY for two reasons: AGRs may take “comp” time when weekend drills occur. It also counts the two-week annual training for the military technicians as “double time.” Military technicians’ time off for annual training is taken from their regular work year. Both assumptions make only a very small difference in estimates of FETY.

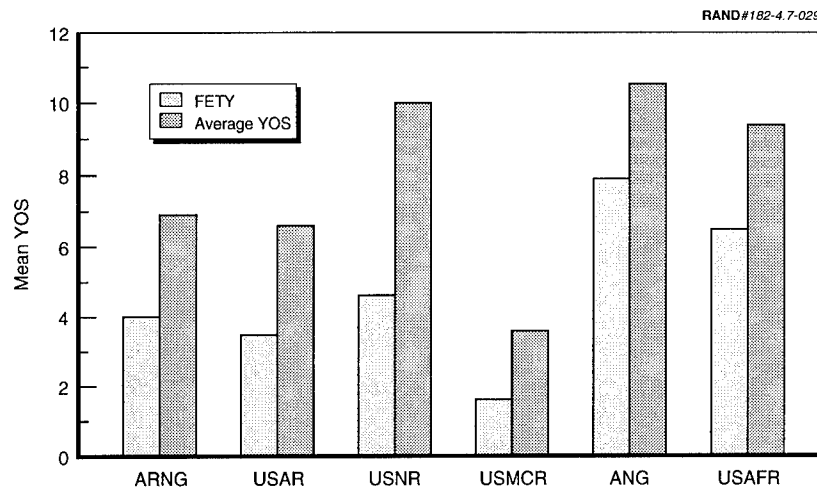


Figure 4.7—Comparison of Different Definitions of Experience:
Enlisted Personnel, FY89

components for officers and enlisted personnel as computed by these two measures. The mean FETY is computed by aggregating all individual experience as measured by FETY and then dividing by the number in the component. Not unexpectedly, the result is a substantial decline in experience among both the officers and enlisted personnel from the level based on the more commonly used measure of experience. For example, among the officers, the average level of experience declines by almost 50 percent or more, regardless of component. Among the enlisted, the decline is less marked, although still fairly substantial, between 25 and 50 percent. In terms of our framework, this FETY index more accurately measures the training time available to the reserve components for effective training and provides a more realistic picture of the actual training opportunity for reserve officers and enlisted personnel.

Comparing the Distribution of FETY for Similar Active and Reserve Personnel⁵

To highlight the difference in experience levels between NPS and PS personnel in the various components, Figure 4.8 shows comparative measures of the average military experience or FETY of PS and NPS personnel for selected senior officer and enlisted pay grades in the FY89 force.

NPS personnel in senior positions have less than one-half the military training opportunity of PS personnel. This means that a substitution of an average NPS person for a PS person in senior ranks would reduce military experience by more than one-half.

⁵We need to mention an important caveat to these comparisons. Active component members, particularly officers, have to take headquarters and other policy or administrative billets, while reservists stay in operational billets. Our FETY measure fails to account for this and thus, to some degree, underestimates the relevant experience of reserve members and overestimates that of active members.

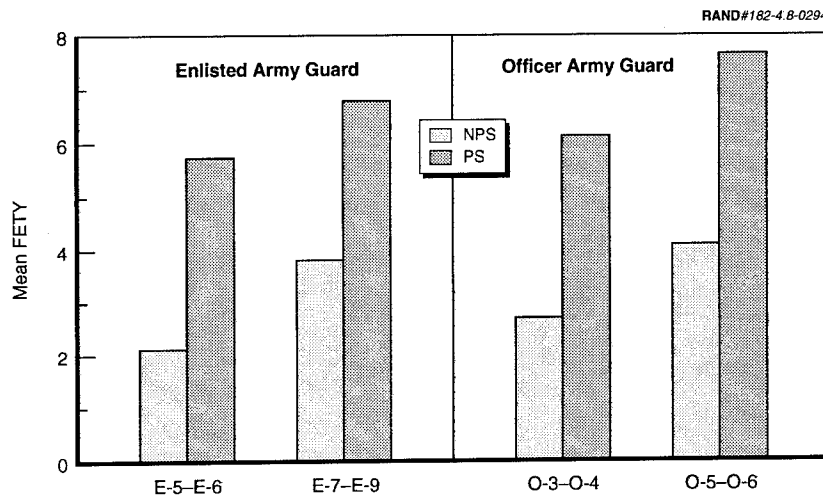


Figure 4.8—Mean FETY Among Senior Pay Grades in the Army Guard in FY89

Because mean levels of experience can hide very large differences in the spread of experience levels, a better comparison is to look at the range of the distribution, to see how the active and reserve components stack up against each other. This allows one to see, for example, what would happen when units with the same Table of Organization and Equipment (TOE) are placed in the reserve rather than the active force, in terms of actual experience levels of the units. We found considerably greater variance in the experience levels of the reserve units than in the active units, despite the fact that they have identical TOEs. We use the Army components to illustrate this point.

We selected similar pay grades for both active and reserve components and then compared the distribution of experience as measured by the FETY index (see Figures 4.9 and 4.10). The figures show the percentage of personnel having each level of FETY. The data show that active O-4 officers generally have between 13 and 18 years of experience, while the reserve distribution is much more spread out. Most Reserve O-4s have between 4 and 8 FETY, but about 20 percent have 20 or more FETY. The latter group consists primarily of full-time personnel. The enlisted distribution for E-6 looks somewhat similar to the officers except for having more personnel with 8 to 19 YOS. The data leave little doubt that ARNG and active personnel serve in similar grades with very different levels of experience. In most cases, ARNG personnel have significantly less experience than active, but full-time ARNG personnel have more experience. The implications of these experience differences need much further research, which we will outline later.

Figures 4.11 and 4.12 summarize the distribution of FETY for three officer and three enlisted grades for the ARNG and the active Army. Almost all active Army officers have similar levels of experience. An O-2, for example, has between 3 and 5 years of service and an O-6 has 20 years of service (with hardly any variation). In the two reserve components, similar officers have varying levels of experience, and the range can be quite wide when one considers higher pay grades. For example, O-4s in the

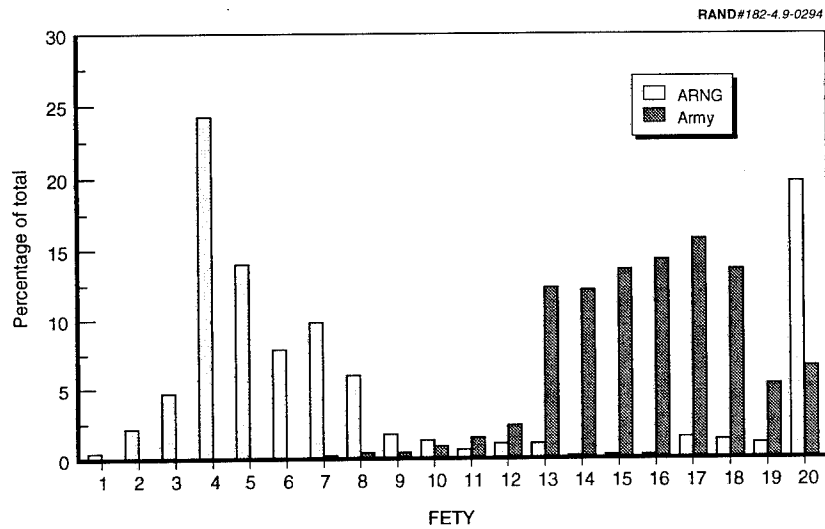


Figure 4.9—FETY Distribution for Active and ARNG O-4

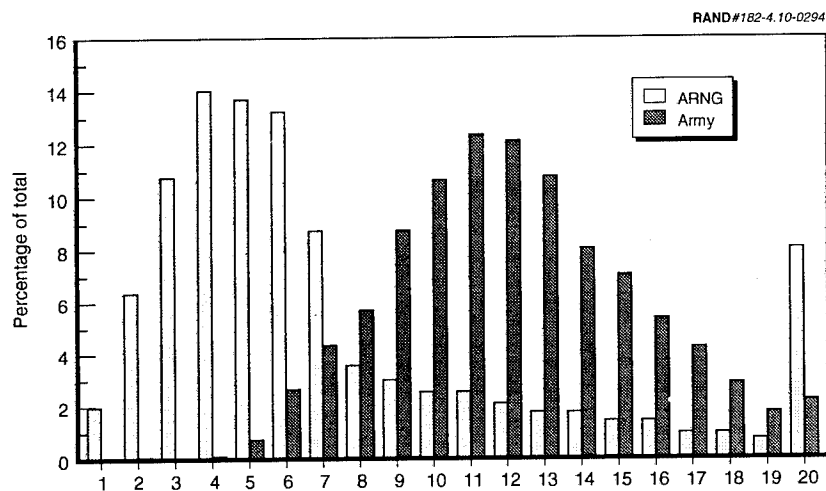


Figure 4.10—FETY Distribution for Active and ARNG E-6

ARNG may have levels of experience that vary between 5 and 22 years. The situation is similar in the Army reserve. The difference in variation between the active and reserve components is even more marked when we look at O-6s.

The junior enlisted personnel in the reserve have slightly less experience than their active counterparts. The disparity between the active and reserve becomes much larger when we focus on senior enlisted personnel. For example, an E-8 in the active Army tends to have between 17 and 24 years of experience. In the guard, the spread is much greater, ranging from a low of 5 to a high of 30 equivalent years of service. Similar results are found in the other services. These figures show us that, as measured by FETY, the AC has considerably more experience than the RC. But they

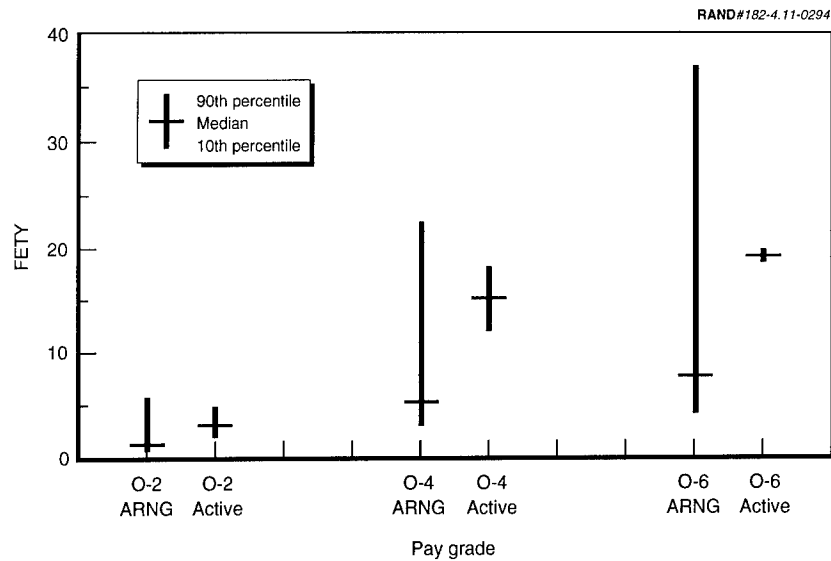


Figure 4.11—Comparing the 10th and 90th FETY Percentiles for Active and ARNG Officers

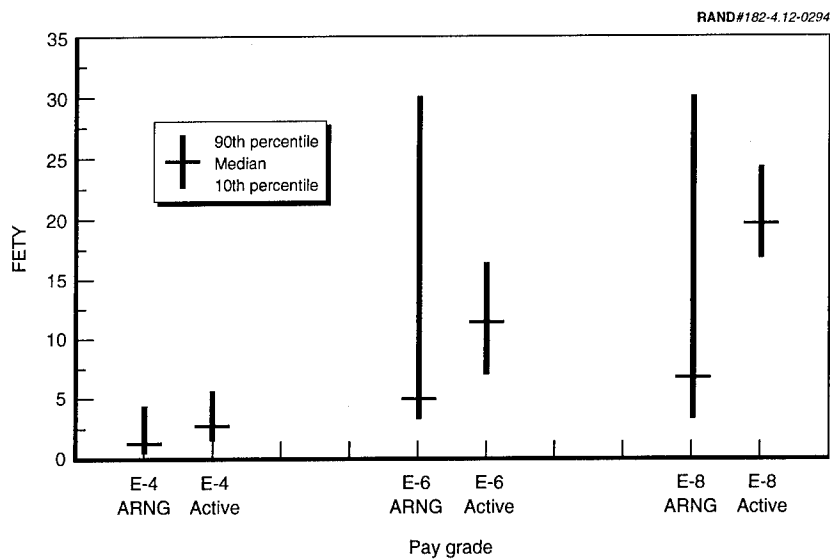


Figure 4.12—Comparing the 10th and 90th FETY Percentiles for Active and ARNG Enlisted Personnel

also show that the RC experience has a considerably wider range than the AC and that the range varies among the services.

The implication is that the AC is more homogeneous with respect to experience in the various pay grades. Average levels of experience are not only lower among the reserve components than their active counterparts (with the exception of the air

components), but, in addition, the variation in the levels of experience is much greater.

IMPROVEMENTS NEEDED IN MEASURES OF EXPERIENCE

The two aggregate measures of experience—YOS and FETY—provide different assessments of the experience of reserve personnel and the source of that experience. YOS equates reserve years of service with active years, while FETY credits reserve years with a fraction of active years based on relative days available for training. As mentioned earlier, one can consider these two measures as reflecting the upper and lower bounds on the relative value of reserve service. There is a wide difference in the conclusions that would be drawn from the two measures about the relative experience of active, PS, and NPS personnel and about the sources of that experience. Neither measure is free from criticism, and research is needed to provide better measures.

The improvements fall into five categories:

- developing improved measures of the relationship between experience and job proficiency by job groups
- research on job retraining times and skill proficiency for PS and NPS personnel retraining into different skills
- research on skill decay during gaps in service and “relearning” curves
- incorporating civilian experience into experience measures
- research on developing comparable measures of actual time spent by active and reserve forces on training and on the quality of the training experience.

Relationship Between Experience and Job Proficiency

Experience measures are useful only to the extent that they correlate with job proficiency. All other things being equal, more experience usually indicates more job proficiency. Experience measures are used as surrogates because measures of job proficiency are expensive to collect. So, the key question in developing experience measures is whether the units of experience are correlated with job proficiency.

A key concept in measuring job proficiency is that a unit of experience can be valued differently depending on the level of previous experience—the so-called learning curve. Once a skill is learned and mastered, additional levels of experience do not provide as large an increase in proficiency as when the skill was first learned. This implies that, with respect to learning a single job or skill, a reserve year of service will be valued closer to an active year as years of job experience increase. Thus, a reservist who comes to the reserve with 8 years of active service and then serves a year of reserve service may lose little proficiency with respect to a similar individual who stayed on active duty. Alternatively, active years will be valued markedly higher than reserve years when an individual is still gaining skill proficiency.

This leads to a second key concept: Relative valuation of reserve and active years will depend on the type of skill and the length of training required to master skills. For some simple skills that can be mastered with IADT training, reserve and active years may provide little difference in skill proficiency. For skills that require longer initial training periods and long periods of on-the-job training, active years will be valued much higher than reserve years, because significant differences will exist in job proficiency gained in active and reserve years. So, relative valuation of active and reserve years will differ by skill.

More research is needed concerning the relationship between job proficiency and experience, especially when the experience is not continuous. It is important to understand what types of skills reservists can maintain under part-time training conditions and how much their job proficiency depends on earlier experience in the active force.

Job Retraining and Skill Proficiency of PS Personnel

Another complication is that PS personnel often do not utilize their specific active occupational skills in the reserve forces. A year of active experience may have provided little specific experience if the reserve job is dissimilar. Figure 4.13 shows survey data from enlisted reservists on the proportion of PS personnel whose reserve job in the year of entry matches their active-duty three-digit occupational code. The data show wide variation in the component's ability to match active and reserve jobs. For the Naval Reserve, 70 percent of PS reservists work in initial jobs matching active-duty occupations. However, for the ARNG, less than one in three have a direct three-digit occupational code match in the first year. Research on Army PS personnel (Marquis and Kirby, 1989a, b, and c) shows that the match rate shows only small improvement when allowance is made for switching to similar skills (two-digit matches are used).

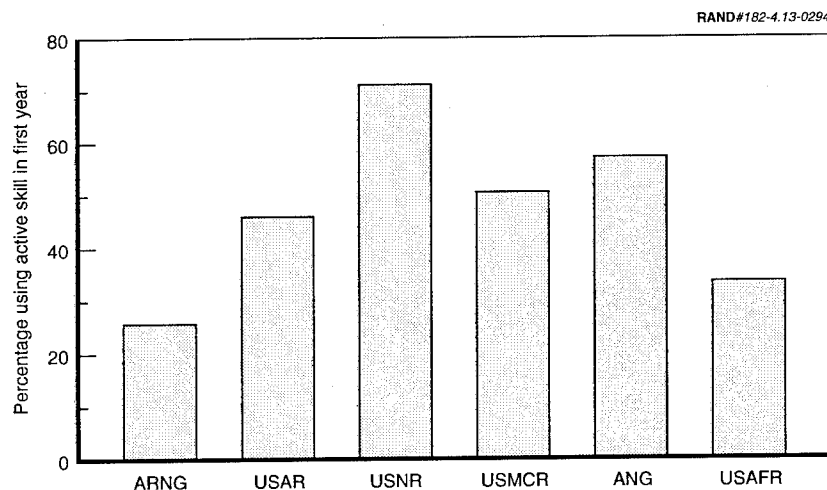


Figure 4.13—Percentage of PS Personnel Whose Active and Reserve PMOS Match in First Year of Reserve Service

These data show that most PS personnel who enter reserve components must be retrained into new skills. When measuring the value of a year of active experience, this must be taken into account. A value of an active year should be reduced in this case when similar skills are not practiced. Further research is required to isolate the value of active service in reserve job proficiency. Active experience may impart more generic skills that make learning and mastering new skills faster and more certain, so active service will have some value independent of the specific occupational skills learned.

Skill Decay in Gaps Between Active and Reserve Service

An additional problem is that neither measure takes into account the fact that a significant gap might occur between active and reserve service. The value of active service experience may decline if individuals do not join reserve forces soon after separation. Skill decay occurs in this gap between active and reserve service.

If prior active service personnel join reserve service shortly after separating, their skills will not be subject to decay. However, those joining many years after separation from active service may bring little of their active-force-specific skills. However, even if skills have decayed, the active service will provide generic skills and still serve as a credentialing device ensuring future trainability and job proficiency.

Figures 4.14 and 4.15 show the cumulative rate of entry into reserve service from the point of active separation for the FY84 loss cohorts for officers and enlisted personnel. The data show a fairly rapid rate of joining, with nearly 75 percent of those who will join joining the reserves within 2 years; rates are slightly slower for the Army than for the other services. However, for about one in four PS personnel, there is more than a 2-year gap in service.

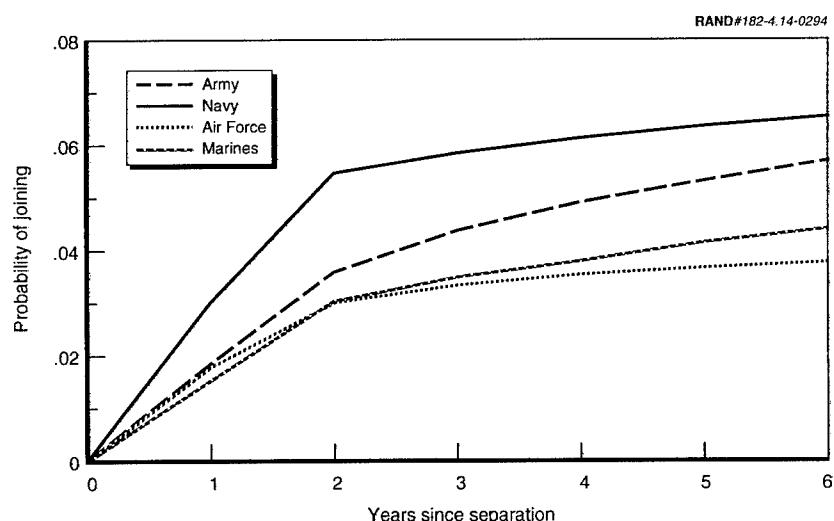


Figure 4.14—Timing of Entry into the Reserve: Officers, 4–15 YOS, FY84 Losses

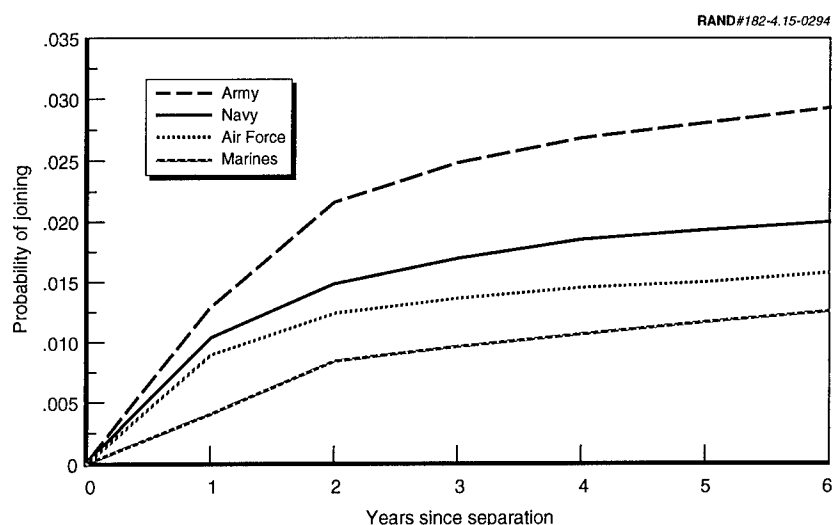


Figure 4.15—Timing of Entry into the Reserve: Enlisted Personnel, 4-15 YOS, FY84 Losses

The data certainly indicate a preference among PS personnel and/or the components to join fairly quickly after active service. However, the fact that individuals with more than a 2-year gap are still actively recruited may indicate long skill delay times or fast relearning curves.

Accounting for Transferable Civilian Experience

Another problem with measures that attempt to capture military experience is that civilian experience can be important for reservists if their civilian and military jobs are related. For certain skills, such as physicians, nurses, and pilots, a significant proportion of reservists hold similar civilian and military jobs. We used the survey of mobilized and nonmobilized reservists fielded in the spring and summer of 1992 to examine this issue.

Figures 4.16 and 4.17 show that transferability of skills is not common for reservists, although officers perceive higher levels of transferable skills than do enlisted personnel.

Figure 4.16 illustrates the degree of similarity between military and civilian occupations for officers. For the Air National Guard and the Air Force Reserve, the correspondence is quite high. In the Air Force Reserve, for example, about 70 percent felt that their civilian occupations were very similar or somewhat similar to their military occupations, as did about 60 percent of the Air National Guard officers. This close correspondence probably results from the large number of officers who have civilian jobs as pilots, doctors, nurses, and aircraft maintenance personnel. Ground combat forces see less correspondence with their civilian occupations. In the Army National Guard and the Marine Corps, less than 15 percent see a close relationship, and almost 60 percent see no relationship at all.

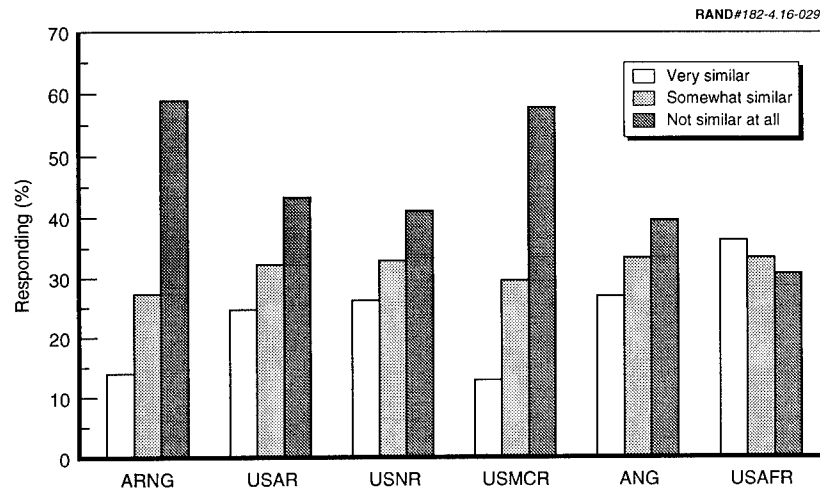


Figure 4.16—Perceived Similarity of Reserve and Civilian Jobs: Officers, FY92

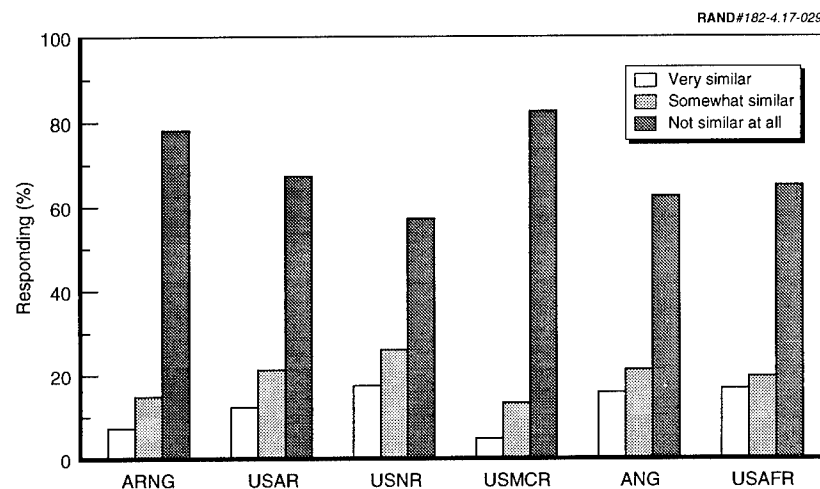


Figure 4.17—Perceived Similarity of Reserve and Civilian Jobs: Enlisted Personnel, FY92

Figure 4.17 shows similar survey data for enlisted personnel. Most reservists see no similarity between their two occupations. As with the officer corps, those in the land combat forces see less similarity than either the Navy or the Air Force. But even in those services, less than 20 percent of the respondents regard their civil and military occupations as closely related.

An important question concerning the relative value of PS and NPS personnel is who brings more transferable civilian experience. If NPS personnel brought more transferable civilian experience, it would narrow the differences between the two types of personnel. Figures 4.18 and 4.19 compare the transferability of civilian skills

for PS and NPS personnel. For officers, the data show that NPS personnel do bring greater levels of transferable civilian experience.

However, the data for enlisted personnel show the opposite effect. NPS officers may be self-selected to a greater degree than enlisted personnel to match reserve jobs. Some of this difference may be accounted for almost entirely by pilots and health professionals, and further research is necessary to find out what particular transferable skills NPS personnel are bringing to reserve jobs.

Improved measures of experience must take related civilian experience into account, and since this varies by skill, it will be important to develop experience measures at

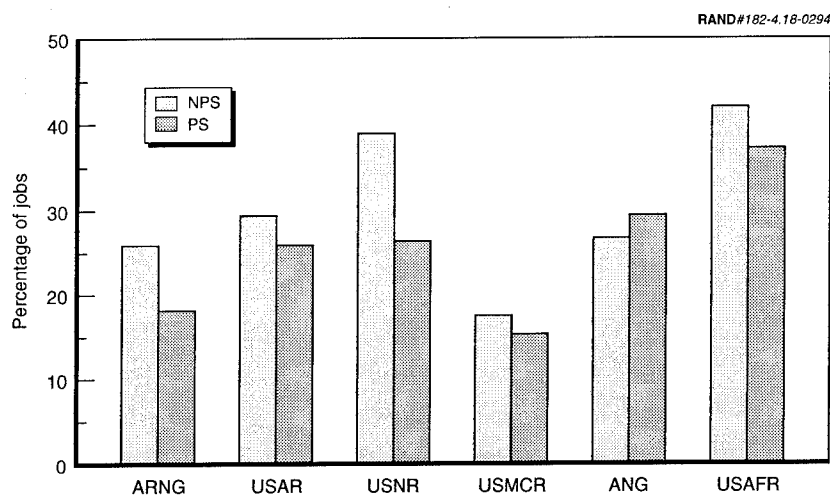


Figure 4.18—Percentage of Reserve and Civilian Jobs Perceived to Be Very Similar: Officers, FY92

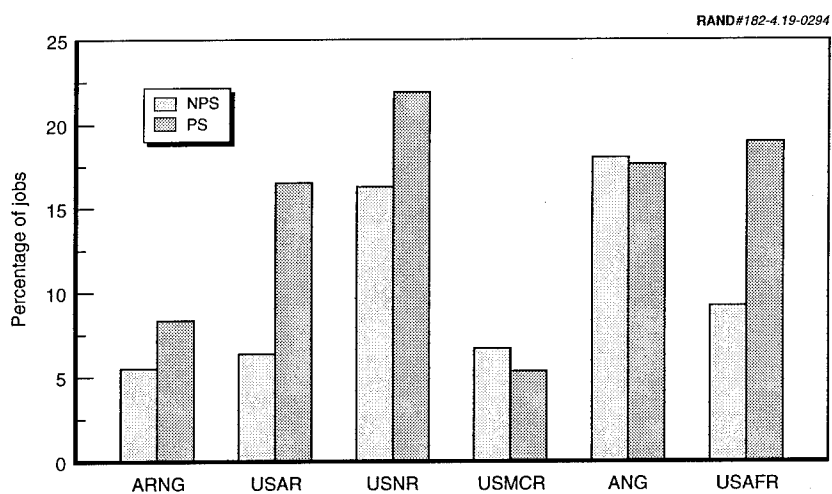


Figure 4.19—Percentage of Reserve and Civilian Jobs Perceived to Be Very Similar: Enlisted Personnel, FY92

the skill level. If NPS personnel bring transferable skills in certain areas, PS content rules need to be modified to take this into account.

Measures of Actual Training Time and Quality

As stated above, another problem is that both of these measures attempt to measure training opportunity rather than the amount or quality of actual training time spent. Much research is needed to develop better measures of how much time is actually spent in training for active and reserve forces and to provide measures of the quality of that training time. The quality indicators should take account of differences in training facilities and equipment, as well as the realism of the training compared to actual combat situations. Although such measures would be useful, validation would probably be required through periodic tests comparing the actual job proficiency of active and reserve personnel.

SUMMARY

NPS officers in the FY89 reserve force had lower educational attainment than PS officers. The lower college graduation rate is partly explained by enlisted personnel who are commissioned by the guard.⁶ For enlisted personnel, the educations of NPS and PS personnel are more comparable. Only the Army reserve components have lower educational attainment among NPS personnel, but the differences are not large. For the other components, the NPS personnel compare favorably with PS personnel for educational attainment. This may be partly due to the relatively small number of NPS personnel recruited by these components, which allows them to be highly selective.

Our data show that, at similar pay grades, NPS personnel have about one-half the training opportunity of PS personnel when measured by average days of military service. However, the importance of these differences varies by skill and depends on the shape of the learning curves in various skills. The importance also depends on whether PS reservists utilize active-duty skills and the value of the various generic skills learned by PS personnel in the active force. More research is needed to bring the experience differences between PS and NPS personnel into sharper focus.

We also found that NPS officers more often work in jobs that are perceived to be similar to reserve jobs than do PS personnel. So civilian transferability may in some instances partially compensate for lower levels of military experience. This transferability occurs at much higher levels for Navy and Air Force NPS officers and is probably due to the influence of a few occupations, such as physicians and nurses.

For enlisted personnel, the levels of transferability of civilian skills are much less than for officers, and NPS personnel bring lower levels of transferability than do PS personnel. The Navy and air components again have higher levels of transferability among NPS personnel than do the other components.

⁶It should be noted that a bachelor's degree is required for promotion to O-3 and higher ranks.

UTILIZATION OF PS AND NPS PERSONNEL

How reserve forces utilize PS personnel can provide some indication of what characteristics of PS personnel are valued and the effects of substituting NPS personnel for PS personnel. While NPS personnel can bring civilian skills to reserve jobs, PS personnel bring at least three experience-related advantages to reserve service:

- proficiency and experience in a specific skill
- generic military knowledge and experience not associated with a specific occupational skill
- a prescreening process that may lower the costs for successfully filling reserve jobs.

The more-generic knowledge can be acquired during basic training, or through experience with military discipline, military operating styles, and leadership and supervisory skills. PS individuals may also be valued because completion of an active term of service provides a screening or "credentialing" effect that improves the chances for more rapid skill proficiency and successful completion of skill training than for NPS personnel. Only about two out of three individuals entering active service will complete their term of service. Since only those completing their active service term are generally eligible for reserve service, a PS candidate has an advantage in that he or she has survived a screening process that may significantly increase the likelihood of good performance in reserve service regardless of job assignment. Such individuals may be able to switch skills successfully and perform well at a variety of military skills. So, the value of prior active service may partly be to identify a pool of individuals who, with high certainty, are trainable and perform well. If this pool declines, it may mean higher costs connected with recruiting and screening more NPS personnel to fill reserve jobs.

In this chapter, we will look at the choices the components make between PS and NPS personnel when recruiting for specific positions and when promoting into higher positions. These choices are a source of information concerning the relative value of the characteristics of PS and NPS personnel. We look at three dimensions of utilization: whether PS personnel are more utilized in junior, midlevel or senior positions; whether the reserves utilize PS individuals in the same skills as learned in the active force; and the extent to which the reserves retrain PS personnel to fill jobs, as opposed to utilizing NPS personnel.

PS CONTENT OF LOW-, MID-, AND HIGH-LEVEL RANKS

PS content is much higher for very high ranking positions than either mid- or junior-level positions for both officers and enlisted personnel in practically every component (Figures 5.1 and 5.2). The officer data show that all components (except the ARNG) have PS contents of 80 percent or more among their O-5 and O-6 personnel. Even the ARNG currently has about 65 percent PS content for O-5 and O-6 personnel.

The pattern for enlisted personnel is similar. For all components except the ARNG, 60 percent or more of E7–E9 part-time personnel have prior active experience. Even

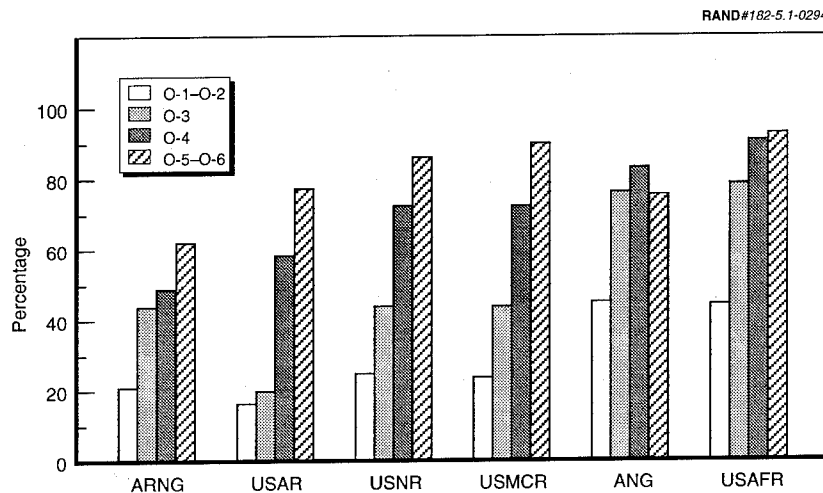


Figure 5.1—Percentage Prior Service Among Part-Time Officers by Pay Grade in FY89

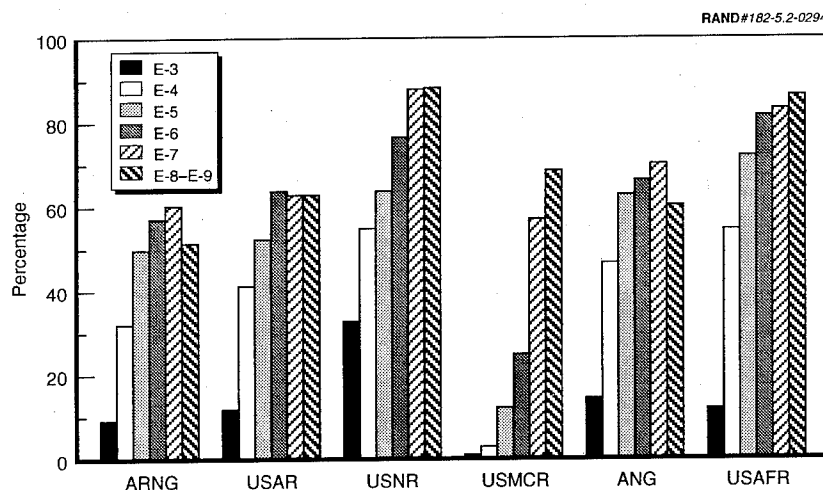


Figure 5.2—Percentage Prior Service Among Part-Time Enlisted Personnel by Pay Grade in FY89

the ARNG draws over 50 percent of its senior part-time enlisted personnel from those with prior active service. Regardless of component, it is clear that the PS content is usually higher for more senior positions.

The utilization of PS in midcareer positions (O-3 and O-4) is somewhat less than for senior positions. This utilization pattern can develop either because PS personnel have higher retention and/or promotion rates than NPS personnel or because the mix of PS and NPS personnel at entry has varied over time. For instance, senior officer and enlisted personnel usually have 20 or more years of service, and many entered after the Vietnam war, when there was a plentiful supply of PS personnel. So, the high proportion among senior pay grades may reflect heavy affiliation of veterans after the war. On the other hand, it could be that PS personnel have higher retention and promotion rates, which would account for the higher senior mix.

In either case, the choices show a preference for PS personnel. In the case of heavy recruitment after Vietnam, it shows that, when PS personnel are plentiful, they will be recruited more heavily. In the case of higher retention and promotion, it implies that PS personnel are probably promoted at faster rates than NPS personnel into mid- and high-level positions, which would also raise retention. Faster promotion could imply that PS personnel carry specific job proficiency, leadership and/or supervisory advantages into the more senior positions.

If the heavy PS percentages in the senior ranks are due to widespread availability after the Vietnam war, we would expect a decline in PS content of senior positions even in the absence of drawdown. PS content of senior ranks could then potentially fall to the current content of midlevel ranks. However, if promotion and retention are the cause, then senior ranks would be expected to be maintained. These are important questions, and further research is needed to test these hypotheses.

UTILIZATION OF ACTIVE-DUTY SKILLS

A major potential advantage of prior active-service is the skill proficiency in an MOS. This will be particularly true for those serving a single term in the active force, since they will not generally have supervisory or leadership experience during this term. Active-skill utilization in the reserve might not occur, either because the reserve job requires a different skill than the active job or because a long gap occurs between active and reserve service so that the active skill deteriorates to a significant degree. A potential indication of the value of PS personnel is the extent to which the reserve forces retrain PS personnel into different skills as opposed to training NPS personnel.

How often do PS personnel utilize their active-force occupational skills in their reserve job? PS personnel seeking enlistment will often find that the reserve positions open in units close to home do not include their active skills. Units will also commonly find that PS personnel cannot be found that match skills for many skills. The chances for a skill match depend on the specific skill learned in the active force and the demand for that skill in the reserve. Some skills are associated with missions primarily assigned to active units, and the reserve may not have units that demand those skills. There are also missions primarily assigned to reserve units, and the

chances of obtaining PS personnel with those skills are small. Even if the active component trains many people in a given skill that the reserve forces demand, the chances of individuals moving to a geographical area where a unit needs that skill are not high. So units and individuals will be faced often with the choice of retraining PS personnel or filling positions with NPS personnel.

Figure 5.3 shows the match between active and reserve jobs for enlisted personnel at the three-digit occupational skill level as a function of time in the reserve. Overall, the data show that less than one-half of PS personnel match active and reserve jobs during their initial assignment. This indicates that about one-half of PS personnel receive retraining into a different skill upon entry. The Air National Guard, Navy, and Marine Corps have the highest match rate at entrance, and the ARNG has the lowest.

The data also show that skill switching occurs frequently as individuals gain reserve experience. For some components, the match rates are higher in the second year after entry than in the first, and this could indicate that individuals switch to matched jobs that may not have been available at entry. However, the overall trends in matching jobs decline after the second year, and this indicates that switching to nonmatched jobs occurs frequently. After 5 years of reserve service, fewer than one in three PS personnel in the air and Army components utilize their active skills. The Navy and USMCR appear more successful at keeping individuals in active skills.

If the sole value of active PS personnel were a specific job skill, PS and NPS personnel would be on an equal footing for filling jobs that did not match active skills. The retraining of PS personnel into different jobs and more senior jobs suggests that generic skills and credentialing may provide some of the value of PS personnel.

This credentialing may lower the costs of filling reserve jobs. Filling jobs with NPS personnel means creating a pipeline of people at lower grades to fill higher-level

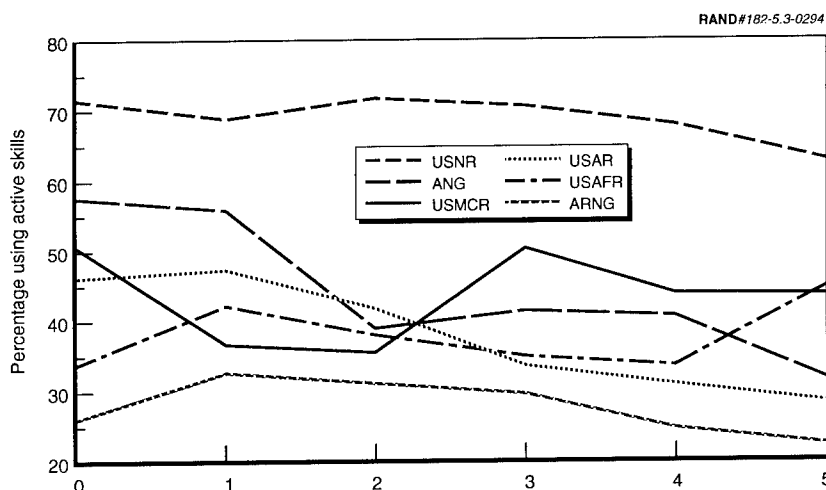


Figure 5.3—Percentage of PS Reservists Using Active-Duty Skill over Time

jobs. This pipeline has to account for attrition, so more than one NPS person has to be trained to guarantee filling a more senior job. If attrition during basic training and advanced individual training is high, the cost of maintaining the pipeline can be high. Filling that job with a lateral-entry PS person prevents the cost of a pipeline, but entails retraining costs and the associated risk of attrition during retraining. The fact that retraining of PS personnel occurs so frequently may indicate that the relative costs of successfully filling a job may favor PS personnel.

More research is needed on the relative costs of filling reserve positions with PS and NPS personnel, taking into account both pipeline and retraining costs, as well as attrition once in the job.

SUMMARY

The question of what is valued about PS personnel and NPS personnel is critical in determining the extent to which NPS personnel can be substituted for PS personnel. In this chapter, we identified three characteristics of PS personnel that could give them a competitive edge over NPS personnel:

- proficiency and experience in a specific skill
- generic military knowledge and experience not associated with a specific occupational skill
- credentialing from successful active service completion, thus ensuring easier and more successful retraining in a variety of skills.

On the other hand, the civilian experience of NPS personnel can contribute to their military skills.

The question of the value of PS and NPS personnel clearly needs to be answered for each skill and grade level, since different skills and grades have different retraining times and costs, different learning curves, and different opportunities to utilize civilian experience. At one extreme, NPS physicians and pilots can bring civilian experience that could be prohibitively expensive to obtain by retraining other PS personnel. On the other hand, senior combat noncommissioned officers may need experience that can only be provided effectively through active-force service.

The question of how reserve forces value different aspects of PS experience can best be empirically determined through analysis of decisions regarding recruiting, promotions, and retraining. We have analyzed FY89 distributions of PS and NPS personnel by pay grade to see if PS personnel are utilized more often in higher pay grades. The evidence indicates that there are more PS personnel in the highest pay grades than in midlevel grades. However, further research is needed to determine if this is due to faster promotion or more longevity or perhaps due to earlier recruiting patterns favoring PS personnel in the post-Vietnam era. Research focusing on the effect of prior military experience on promotion decisions is an important part of this research agenda.

We have also analyzed the utilization of active-duty skills of PS personnel in the reserve forces. We find that less than 50 percent of PS personnel utilize active-duty skills at entrance, and this further declines to less than 1 in 3 after 5 years in the reserve forces. This extensive retraining of PS personnel may indicate that credentialing and generic military skills are valued—perhaps because they ensure easier and faster retraining and better job proficiency. Again, research is needed to determine the cost and proficiency trade-offs at various skill and grade levels between retraining PS personnel and maintaining a larger pipeline of NPS personnel.

RELATING PS CONTENT TO PERSONNEL READINESS ISSUES IN THE RESERVE FORCES

Changing PS content may exacerbate personnel readiness problems, and it is important to understand these linkages before addressing policies aimed at solving potential problems. In this chapter, we will choose two important personnel readiness issues to illustrate the relationship of PS content to personnel readiness issues. Exploring these two issues will help to sharpen the critical research questions involving the relationship between PS content and personnel readiness. It will also tend to broaden the focus of the policy options required to solve readiness issues. A single-minded emphasis on raising PS content may not be the most effective or efficient policy approach to solving personnel readiness problems.

TWO RESERVE PERSONNEL READINESS ISSUES ARISING FROM OPERATION DESERT STORM

Several reserve personnel readiness issues surfaced in Operation Desert Storm. One potential problem was the significant supplementation or substitution of personnel (so-called cross-leveling) that was needed just prior to mobilization or after mobilization to achieve deployable units. Second, ARNG combat roundout units that were scheduled to deploy with active units needed extensive postmobilization training and subsequently never deployed.

In Army component units, cross-leveling was used to fill about 25 to 35 percent of positions in deployed units. To fill units to wartime requirements, individuals were transferred from other reserve units prior to mobilization, or individuals from the active, reserves, or Individual Ready Reserve were assigned after mobilization.

The extensive amount of cross-leveling required was surprising, given that the units called were probably designated as higher-priority units in peacetime and were expected to have higher readiness levels. Since less than 20 percent of USAR and ARNG units deployed, a wide choice of units was available, and the units called were partially chosen based on higher readiness levels. The fact that the early-deploying units needed such high levels of cross-leveling indicates that peacetime policies directed toward maintaining higher levels of readiness in some units are probably ineffective. We explore this problem and its relationship to PS content below.

Cross-leveling was required for three reasons. First, some reserve positions were vacant at mobilization. Second, some positions were filled by individuals not yet fully

qualified in their MOSs. Third, some individuals were removed from reserve units because they lacked skill proficiency or physical fitness.

Individuals not yet trained in their skills accounted for the largest proportion of cross-leveling. We first examine this problem across components to determine its severity and its relation to PS content.

Nondeployable Personnel Training for Jobs

Figure 6.1 compares enlisted skill qualification levels for reserve components in FY89.¹ The air components maintain skill qualification levels of nearly 90 percent. However, the Army, Navy, and Marine components have about 20 to 30 percent of enlisted personnel in training for jobs.

The level of personnel in training in reserve units is affected primarily by the following:

- the level of personnel turnover in units
- the availability of PS accessions who do not need retraining for jobs
- the length of time required to train personnel.

Higher levels of personnel turnover in units will generate higher personnel retraining requirements. Figure 6.2 shows the level of stability of personnel in units across

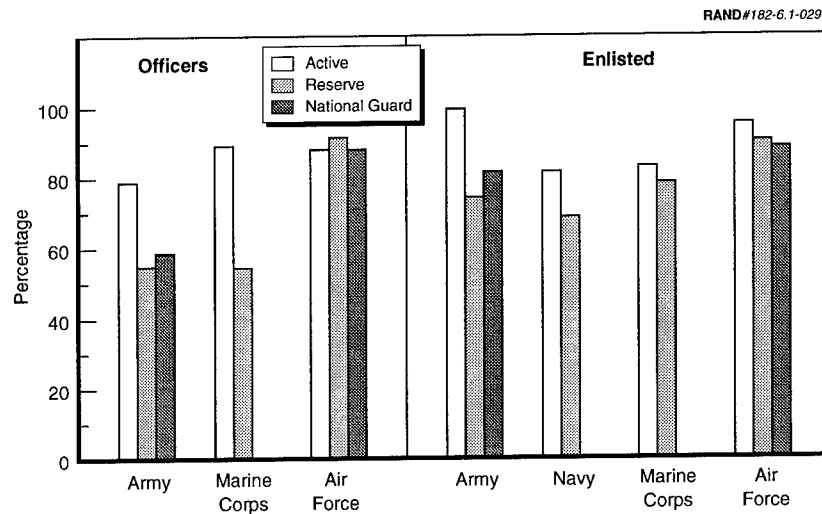


Figure 6.1—Percentage Skill-Qualified in Active and Reserve Components in FY89

¹The skill qualification levels were determined by matching three-digit primary and duty occupational codes. Future work needs to include secondary occupational qualifications, as well as less-stringent job-matching qualifications, such as two-digit levels.

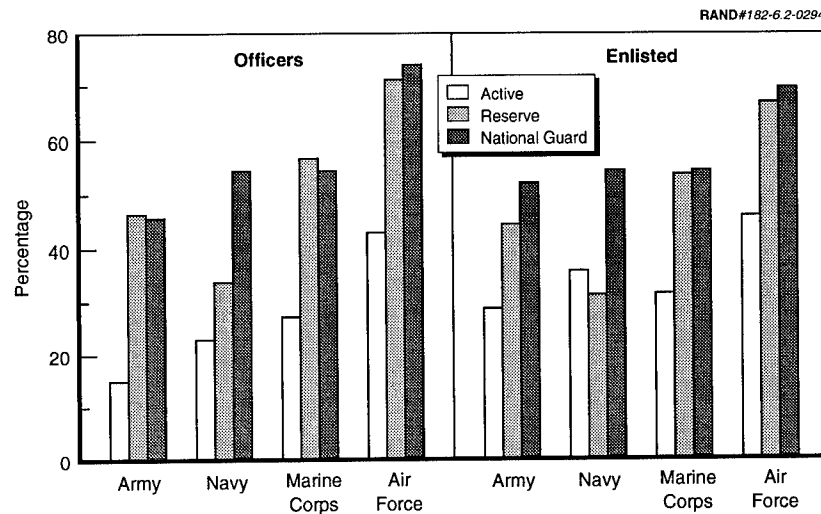


Figure 6.2—Percentage in Same Unit and Same Skill over 18 Months in Active and Reserve Components in FY89

components. It shows the percentage of individuals having stability in both units and jobs² over an 18-month period.

The higher skill-qualification levels of the air components can be partly traced to the fact that they have highest stability among personnel at the unit level among reserve components. Approximately 70 percent of the air component positions are filled by the same enlisted personnel over an 18-month period. The other components have much lower levels of unit stability. The USMCR has the next highest level of stability, with about 55 percent of personnel remaining in their units for 18 months. The Army components have stability rates of about 45 to 50 percent for enlisted personnel, while the Navy has the lowest level of unit and job stability, with only about one-third of personnel in the same unit and job for 18 months.

One potential cause of unit turbulence is geographical moves motivated by changing civilian jobs or family relocation. To the extent that this causes most turbulence, the problem may be relatively immune to policy solution. Figure 6.3 illustrates that long-distance moves are only a small part of unit switching. Most individuals changing units switch to units within 50 miles of the original unit. An alternative hypothesis for frequent unit switching is promotion opportunity (Buddin and Grissmer, 1993). Reserve promotion opportunities arise more frequently in nearby units than in the current units, and promotion often involves switching units and skills (Buddin and Grissmer, 1993). Earlier research (Kirby and Grissmer, 1993) also found that about one-third of an entering cohort of NPS ARNG enlisted personnel switch to the Army Reserve within 5 years, perhaps because the Army Reserve force structure has a greater proportion of higher-grade slots.

²The criteria for skill matching was the three-digit DoD occupational code.

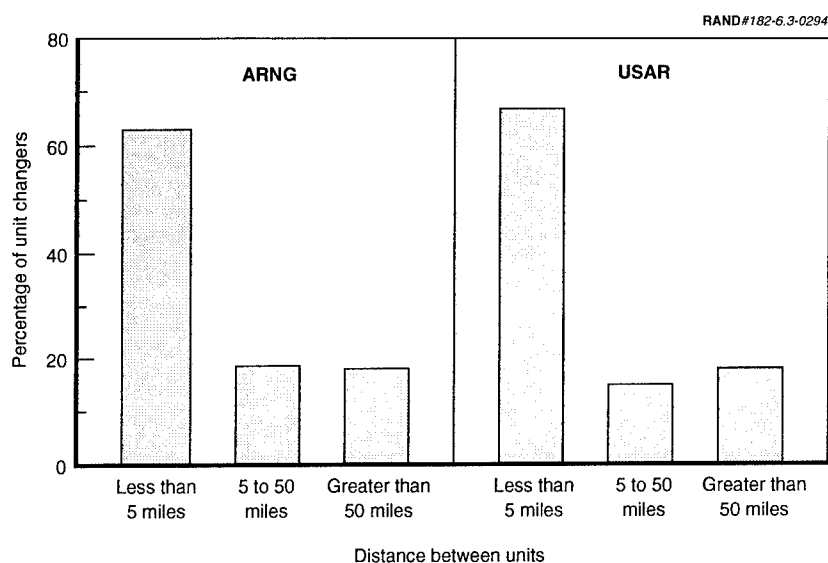


Figure 6.3—Distance of Unit Migration Among Those Changing Units in ARNG and USAR

Besides the rate of turnover, the MOS qualification rate will depend on the time required to fill the position with a trained individual. If all vacant positions could be laterally filled by PS personnel using their active skills, no retraining would be required, and vacancies could be filled quickly with trained personnel. In this case, MOS qualification rates could be maintained at very high levels. The chances of finding a matched PS person increase with the size of the PS pool, and reductions in the number of active veterans will—all other things being equal—decrease the chances of finding matched PS personnel. Thus, more retraining will have to occur, resulting in longer times to fill jobs with trained personnel and lower MOS qualification rates.

However, reductions in the PS pool will also have a second effect. We showed in Chapter Five that PS personnel are frequently retrained into different skills. This retraining of PS personnel instead of filling a job through internal promotion of NPS personnel may result in higher MOS qualification rates. This is due to the fact that lateral-entry retraining of PS personnel does not displace other personnel and thus does not necessitate retraining personnel in more than one job when vacancies occur. For instance, filling an E-5 job with an E-4 may also mean filling the E-4 position with an E-3 and recruiting a new NPS recruit. This can mean a lengthy process of retraining in several jobs. This may help explain the extensive retraining that occurs among PS personnel rather than utilizing more NPS personnel.

To the extent that lateral hiring and retraining of PS personnel results in higher qualification rates, reduction in the PS pool would mean more internal promotion and lower qualification rates. An important research topic is to explore this hypothesis further. The simple analysis here ignores the fact that reducing NPS promotion opportunity through lateral entry of PS personnel may increase NPS attrition rates.

This increased turnover may partially or wholly offset any reduced retraining required when filling by lateral entry.

The problem of turnover and the associated retraining would not be severe if retraining could be done quickly. The number of jobs being filled by not-yet qualified personnel will depend not only on how much retraining is required but on how long that retraining takes. Long retraining times mean long periods that jobs do not have qualified personnel available.

Unfortunately, retraining can take considerable time. Figure 6.4 shows the amount of time it takes to retrain an enlisted reservist in a new skill among those who changed skills (whether they remained in the same unit or joined a new unit) and requalified within a two-year period. What we show in the graph is the median retraining time in each component—the time by which 50 percent of reservists had retrained in their new skills. These median times range from 6 to 9 months (calendar time, not drill time). The longest retraining time is in the Army National Guard, where it takes about 9 months; the shortest times are in the Navy and Army reserve. Reservists in this status are generally lost to their units for such activities as collective training and deployment.

The long retraining time—less than one-half retrain in less than 6 months—indicates how much time can be saved by finding PS personnel with the appropriate skills. However, research is needed on the differences between retraining times for PS and NPS personnel and on the reasons that a significant number of reservists appear to take over a year to be retrained. Earlier research (Buddin and Grissmer, 1993) showed that combat-skill retraining took longer than other skills, perhaps because of the infrequent access to training grounds where field training could take place. However, the process of retraining reservists and the differences between PS and NPS retraining times and competencies need much further research.

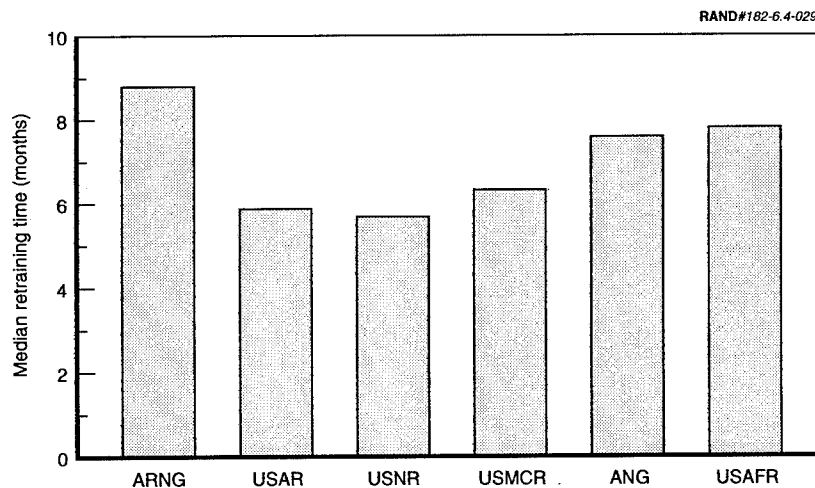


Figure 6.4—Median Retraining Time: Reserve Enlisted Personnel

Maintaining Readiness in High-Priority Units

There is an important difference between active and reserve forces in their ability to keep high-priority units at high levels of readiness. In the active force, high-priority units are given priority in job assignments, and individuals can be relocated from anywhere to maintain full manning with job-qualified personnel. Lower-priority units in the active force may be manned at lower levels. In the reserve force, the option of assigning trained and qualified personnel from other units to high-priority units is generally not available in peacetime. Reservists cannot be relocated to meet high-priority unit needs, and these units must meet requirements for PS and NPS personnel similar to all units from the local labor market.

There is some evidence that the Army components cannot maintain significantly higher levels of personnel readiness in higher-priority units. Part of this evidence is from Operation Desert Storm, in which nearly all units required a significant amount of cross-leveling before deployment. Presumably, the units mobilized in Operation Desert Storm were higher-priority reserve and Guard units.

Figure 6.5 shows job qualification rates for Army units designated as Authorized Level of Organization (ALO) 1, 2, and 3. Figure 6.6 shows PS content level for similar units. The ALO designation specifies the resourcing level given the unit in terms of authorized levels of personnel and equipment. ALO 1 units are authorized close to mobilization requirements, while ALO 3 units are authorized at much lower levels. The data show that ALO does not correlate well with either PS content of units or MOS qualification levels.

The Army has few effective current policy options that would allow it to differentiate high- and low-priority units. Overmanning of high-priority units probably cannot solve these problems, because it is difficult to predict which positions should be

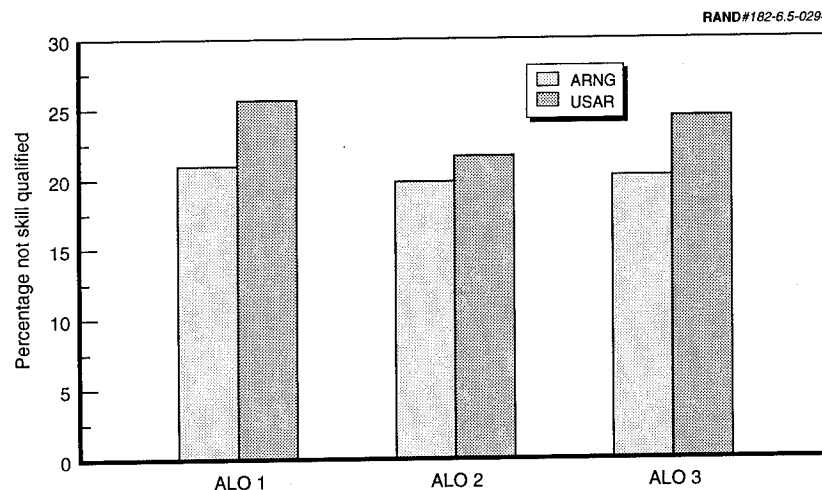


Figure 6.5—Percentage of Enlisted Personnel Not MOS Qualified in Different ALO Units

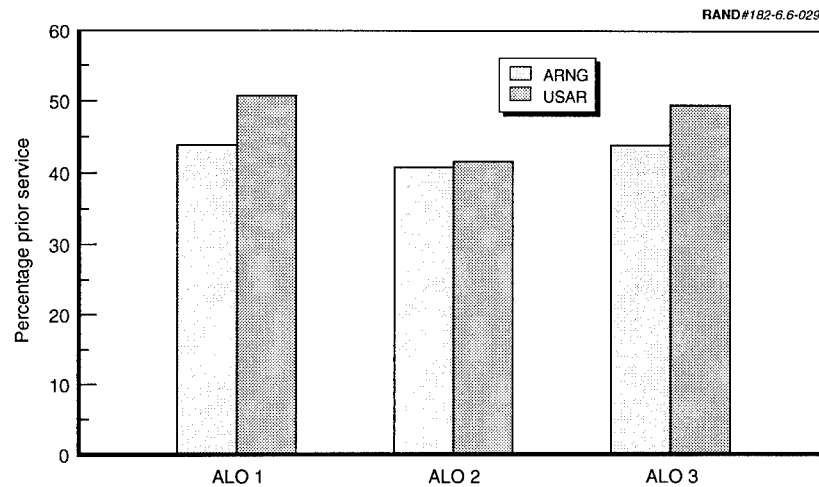


Figure 6.6—Percentage of PS Enlisted Personnel in Different ALO Units

overmanned. The process of recruiting and/or retraining in the reserve forces can take from 4 months to over a year, and predictions would have to be made in advance about what positions would likely be vacant. Predictions can be statistically accurate only if there are a very large number of positions requiring similar job training and if historical attrition patterns in these skills have understandable trends. The active force can do this efficiently, because individuals emerging from the training pipeline can be assigned to any unit and because training requirements can be estimated by job category based on the number of positions with similar jobs and pay grades in the entire force. Thus, if the active Army has a requirement for 30,000 E-4 infantrymen, its planners can estimate attrition patterns from these positions very accurately and have trained personnel ready to fill positions anywhere they occur.

This cannot work for reserve forces, because this process depends on being able to assign newly trained personnel to any unit with vacancies. For reserve units, a training pipeline would have to be established for each unit. Since typical reserve units have between 50 and 150 positions spread across many different jobs and pay grades, accurate predictions of attrition for specific groups of similar positions cannot be made. Attempting to create a pipeline of trained individuals for each reserve unit would result in significant overmanning of reserve units and significant retraining of personnel when expected positions do not open up.

If PS personnel are important to higher readiness, it would become even more important to direct the fewer PS personnel to higher-priority units. However, reduction in PS content under current policies would lead to lower PS content among both high and low-priority units. This places more emphasis on revisions in the reserve personnel and compensation system to place greater incentive on attracting and retaining PS personnel and directing them to higher-priority units. Our policy options in the next chapter address this problem.

SUMMARY

The reserve components appear to be on unequal footing with respect to the severity of current personnel readiness problems, and the drawdown will also affect each component's future personnel readiness differently. Here, we provide a summary of what the current evidence shows with respect to the relative status of the reserve components at the start of the drawdown period and discuss the probable effects of the drawdown. However, much further research, which we outline in the next chapter, is needed to explore these issues.

The air components appear to have the highest ranking among components on almost every personnel indicator that we discussed above, for both officers and enlisted personnel, and there is little difference between the air components. These indicators include

- the highest-quality personnel as measured by education and aptitude
- the highest utilization of prior active service personnel
- the highest levels of military experience
- the highest levels of skill qualification
- the highest level of unit and job stability among personnel
- the highest levels of similarity between reserve and civilian skills
- the largest queue of prior active service personnel wanting to join the reserve
- the lowest levels of PS separation rates.

The healthy state of the air components undoubtedly derives partly from their small size relative to their active components. This allows them to recruit from a large pool of veterans relative to a much smaller number of available positions. This favorable ratio also allows them to utilize active skills more frequently in reserve jobs. The favorable ratio of veterans to job openings also arises from an extremely low rate of attrition, which holds down required new accessions. The experience level is high both because of the high usage of experienced PS personnel and because of the low attrition rate. Finally, the low attrition rate helps provide the highest level of unit personnel stability. However, the higher stability of unit personnel may also be because of a greater degree of satisfaction with current jobs or because the air components have a fairly high grade structure, minimizing demand for promotion opportunity.

The air components may also be less vulnerable to reductions in PS content resulting from reductions in active force size. The air components currently utilize a much smaller proportion of active Air Force losses than other components. This probably indicates that queues of veterans exist that could cushion any sizable increase in the air components or decrease in active-force size.

A decrease in active-force size would mean drawing down the queue, and a key research question is how large a decline in the active force would eliminate the queue

entirely. Because the air components take in very small proportions of their PS pools compared to other components, fairly large reductions in Air Force size may be required to eliminate these queues. Of course, as queues are reduced, some shortages will begin to appear in certain skills, and the rate of skill matching at entry will probably decline. However, currently, the air components appear to start from a substantially better position to sustain personnel readiness during a drawdown and also appear to be able to cushion some if not all of the major effects of drawdown through their queues of reserve personnel.

The USNR and USMCR begin the drawdown with much greater reserve personnel problems than the air components, and these problems appear to be generally on a par with those of the Army components. For example,

- The USNR AND USMCR have the highest level of attrition among officers and nearly the highest for enlisted personnel.
- The USNR has the lowest level of unit and job stability for enlisted personnel.
- The USNR has the lowest level of skill qualification among enlisted personnel.
- The USNR and USMCR currently appear to be at supply-constrained levels for PS officers.

The advantage these components will have over the Army components is that their active components are not currently scheduled to be cut as deeply as the active Army, and so the infusion of prior active-service personnel may not be as drastically affected. These components may also find it easier to reduce the size of reserve forces and thus ease the demand for PS personnel.

The USMCR and USNR are starting the drawdown with markedly different conditions prevailing in their officer corps from those in their enlisted forces. The USNR and USMCR draw over 60 percent of their officers from PS personnel, and they are able to do this because of a very favorable ratio of active to reserve officers. However, these components have the highest officer attrition rate among components, and partly because of this, these components utilize among the highest proportion of active veterans. About 45 to 55 percent of the FY84 active loss cohort joined the reserve. Both components are probably at supply-constrained levels for officers, especially given that these components have the fewest locations nationwide. Partly because of high attrition, these components also have the lowest job stability of officers in units among all reserve components.

For enlisted personnel, the USMCR and USNR have the largest active/reserve ratios among components. This helps them utilize a smaller proportion of active veterans. The Navy draws about 23 percent and the USMCR about 13 percent of active losses, compared to 35 percent for the Army. The exceedingly low draw of the USMCR is partly due to the fact that it has over twice the proportion of junior enlisted positions as any other component and chooses to utilize a large proportion of NPS personnel. As long as the USMCR maintains this policy, it will probably have a large cushion of enlisted veterans to fill the relatively few positions. Almost 30 percent of the USNR's enlisted positions are junior, and this helps it not to draw from active veterans up to

supply-constrained levels. Both the USNR and USMCR appear to have some room to draw down active forces without running into supply constraints for enlisted personnel, but have little slack for officers. Fortunately, their active-force cuts will probably be significantly smaller than those for the Army.

The Army reserve components enter the drawdown with almost all personnel indicators cited here significantly below those of the Air Force, but not dissimilar to the USMC and USNR:

- the smallest ratio of active to reserve service personnel
- the lowest level of military experience and educational attainment among officer and enlisted personnel
- levels of unit and job stability and skill qualification significantly below Air Force levels
- supply constraints with respect to prior active service officers and enlisted personnel
- the lowest PS content for officers and second lowest enlisted PS content.

The Army components start with by far the lowest ratios of active to reserve personnel for both officers and enlisted—approximately one to one—and they have the lowest PS content among officers and exceed only the USMCR in PS enlisted content. Even to maintain these low ratios of PS personnel, they draw the largest proportion of any service of their active enlisted losses and nearly the largest for officer active losses. The Army components currently utilize about 50 percent of officer losses and 35 percent of enlisted losses.

On the whole, they enter the drawdown at greatest risk for future problems with manning. This risk is not only due to current personnel readiness issues; the reductions scheduled for the active Army are proportionally much greater than those for the Navy or Marine Corps, and reserve force cuts are likely to be much smaller than active cuts. This means that the ratio of active to reserve forces for the Army will become even smaller, which could significantly exacerbate present personnel readiness problems.

OBJECTIVES, POLICY OPTIONS TO ACHIEVE THEM, AND A PROPOSED RESEARCH AGENDA

POLICY OBJECTIVES

Several interrelated policy objectives should be considered to ease the transition of the active and reserve forces into the post-drawdown era. Our analysis indicates that the Army will probably be the most vulnerable to reserve-force readiness problems, but other components could encounter some problems, depending on the precise active- and reserve-force sizes set. The Army components carry some readiness problems into the drawdown, and in the long term, the drawdown will exacerbate many of these problems. The interrelated policy objectives include the following:

- raising the PS content for officers and enlisted personnel
- raising the readiness levels of higher-priority units
- making better use of PS experience and skills
- raising MOS qualification levels
- reducing unit and skill turnover
- shortening gaps between active and reserve service
- increasing the skill proficiency of NPS personnel.

We discuss some specific policy options for achieving these objectives below.

POLICY OPTIONS

Maintain a Larger Active-Reserve Size Ratio

We have presented a plausible case that a strong determinant of reserve force personnel readiness is the choice of active-reserve mix. The current mix partially drives an interconnected set of personnel readiness problems in Army components, and these problems are likely to get worse in the longer term if the Army moves to an even smaller ratio between the active and reserve force. The FY89 ratio of active- to reserve-force sizes for the Army was significantly smaller than for other components, and the Army is scheduled to move not only far below current active force ratios but to a ratio significantly below historical levels for the Army. The air components, which our indicators suggest have the highest levels of personnel readiness, have

approximately five active for each two reserve positions, whereas the Army is scheduled to have approximately two active positions for each three reserve positions.

We have presented some evidence and plausible hypotheses that the PS content, the MOS qualification level, the utilization of active skills, the unit and skill turnover rate, and the readiness of higher-priority units can all be affected by the active-reserve force mix. Larger reserve-force sizes also make it more difficult to keep higher-priority units at higher readiness levels. The larger force size means that PS personnel are spread more thinly among units and that there are more units within a geographical area that can encourage skill transfers.

Further research is needed to determine the precise trade-offs between reserve force readiness and active-reserve force size and the extent to which these concerns should actually place limits on the active-reserve mix decisions. However, all other things being equal, there seems to be little point in increasing reserve force size if adding additional reserve units actually reduces total defense capability. Generally, the assumption is that increasing the number of military units always adds some defense capability. However, there is clearly a trade-off between adding additional reserve units and the readiness of remaining reserve units. The lowered readiness of existing higher-priority units might easily outweigh the gain from having an additional reserve unit. Thus, larger reserve forces may lower the average readiness of all units and—on net—lower defense capability.

Adopt a Two-Tier Strategy for Unit Readiness

When reserve force sizes become too large with respect to active forces, a two-tier strategy may be necessary to ensure that higher-priority units achieve higher readiness levels. A two-tier strategy would aim to maintain high readiness levels in a selected portion of reserve units and much lower readiness levels in the remaining units. Achieving consistently higher readiness levels for some portion of units would require significant reform of current personnel and compensation policies to give the higher-priority units a much stronger advantage in recruiting and retaining personnel. It may also require specifying more-stringent definitions for unit manpower requirements for higher-priority units.

Establish Standards of Effective Experience for Critical Positions

When military personnel requirements are currently specified for Army units, the requirements inherently assume that active-force personnel will man units. Unit positions are specified by skill qualification and pay grade, but not by years of experience. This design implicitly assumes that individuals in similar pay grades in the active and reserve forces can perform at equivalent proficiency. However, our data indicate that substantial differences can occur in the military experience for individuals at similar pay grades in the active and reserve forces. To the extent that job experience translates into job proficiency, this system of specifying job requirements will result in different proficiency levels for personnel in similar positions in the active and reserve forces. While military jobs also have associated skill requirements that might help to

close such a gap, the measurement and certification of skill requirements in reserve forces leaves much room for leeway in filling positions.

Specifying both levels of job experience and pay grade for some unit positions would enable this gap to be narrowed and would ensure minimum levels of job experience for critical reserve positions—especially in high-priority units. This job experience measure need not be years of military service, but could be more specific to experience within skills. This would differentiate between active veterans who match and do not match active and reserve skills. The experience criteria for reservists need not be the same as for active personnel, and differences can exist across high- and low-priority reserve units. Minimum experience levels within jobs could also include provision for transferable civilian experience.

If critical reserve positions carried minimum experience requirements and if the compensation for these positions reflected the greater experience required (discussed below), PS personnel would have incentives to seek such positions. Perhaps more importantly, persons without the minimum experience would not fill these jobs and therefore not block more experienced personnel from entering or being promoted into the jobs.

This system would effectively prevent some jobs from being filled by NPS personnel. It would also give individuals who have more PS experience an advantage in the range of jobs open to them. Having 4 or 6 years of active service would allow more promotion opportunity than just 2 years of active service. Overall, it would guarantee that positions would be filled with more experienced personnel and that the experience of PS personnel would be more effectively utilized.

Revise Active and Reserve Personnel and Compensation Policy

Some personnel readiness problems existed in reserve forces at the time of ODS. These problems are partly traceable to personnel and compensation system deficiencies (Grissmer, Buddin, and Kirby, 1989). The drawdown and restructuring of military forces will exacerbate these problems and increase the priority of major revisions in personnel and compensation policies. The new policies generally need to be directed at meeting the policy objectives specified above. However, it should be emphasized that not all components have these problems, and the degree of a problem depends very much on the relevant military occupational specialty and pay grade. Thus, across-the-board changes in compensation and personnel policies may not be warranted, but rather a series of more-flexible policies aimed at particular components and skills.

Restructure Incentives to Attract and Retain PS Individuals and to Utilize Active Skills More Frequently. A contributing factor to building a reserve force with higher PS content and better utilization of PS skills is the reserve compensation system structure. The reserve compensation system is based on a military pay table that was structured by grade and YOS and addresses active personnel issues. As we have shown, an active and a reserve year of service do not provide similar military experience. Thus, we are increasing pay levels in the reserves at the same rate as in

the active force for an additional year of service, even though we do not buy equivalent increases in marginal productivity. This pay table also means that we pay an active PS individual with 5 years of active service and 1 year of reserve service at the same rate as an individual with 6 years of reserve service, even though the latter has less than 20 percent of the military experience of the former. PS personnel get no extra pay for their greater experience, and so loss rates show little difference between PS and NPS personnel at similar years of service. Essentially, the pay system provides no additional incentives¹ for PS personnel to stay.

The current reserve pay system also encourages unit switching, because it provides large pay increases for promotion and small increments for longevity. A typical E-5 will receive an immediate 10 percent increase upon promotion, and a 3 percent increase for serving two more years in the current grade. Moreover, many reservists stay in grade so long that they no longer receive longevity increments. This means that the only route to higher pay is promotion. Since promotion opportunity inside a unit occurs infrequently within many skill groups, promotion often means changing skills and units. The result is an incentive system that encourages individuals to seek higher pay grades as a route to higher pay and to achieve higher pay grades by switching skills. Since the learning of new skills takes a long time in reserve forces, we should move toward a pay system that provides more incentive to stay in skills, and less to seek promotion.

The current reserve retirement system also provides no natural incentives for senior personnel to leave reserve service until age 60, because the retirement system delays payment until age 60. Thus, the entire burden of efficient management of retirement-eligible personnel falls on personnel policies. One result is restricted promotion opportunity.

Ideally, the economic incentives should be greater for PS individuals to stay in the reserves, to the extent they bring increased levels of experience, and to seek and stay in positions that utilize their skills most effectively. The current reserve pay system gives equal credit for an active and a reserve year of service, providing no additional pay for the greater experience of PS personnel. A mechanism is needed to provide additional pay for additional military and job (military or civilian) experience and for utilizing that experience in appropriate positions, for both PS and NPS personnel.

Ideally, a separately designed reserve pay table that rewards actual experience rather than "years of service" and provides more incentives for longevity in a skill would be desirable. However, a proficiency pay table overlaying the current pay table can accomplish much the same result and could also provide the flexibility needed by component, skill, and grade. Other objectives could best be accomplished through special pays, such as enlistment and reenlistment bonus payments.

Establish Proficiency Pay to Reward Experience and Longevity in a Skill. The current personnel turbulence associated with reserve units can partly be attributed

¹The reserve retirement system provides an incentive for PS personnel to stay through retired pay levels that include active-service duty. However, these payments commence at age 60, and their present value adds little incentive for PS personnel with less than 20 years of service to stay.

to the structure of reserve compensation. The military pay table rewards promotion to a much greater extent than longevity. In fact, remaining in the same skill for long periods, which may be desirable for reservists, often means individuals receive no longevity increments. Basically, we need to design a reserve career incentive system that keeps individuals in skills for 5, 10, or 20 years, depending on type of skill, using some variant of proficiency pay that would be superimposed on the military pay table.

Proficiency pay is additional pay designated for certain positions where experience is critical to job proficiency. Proficiency pay could be targeted toward higher-priority units and higher-priority skills. The amount of pay could vary by skill, grade, and amount of experience. The experience increments could take account of both actual active and reserve service using both a measure like FETY and civilian experience. This would ensure that PS personnel would be rewarded for seeking positions utilizing their experience. The additional pay for greater experience could be designed largely to offset the pay advantages of seeking promotion and to give greater incentive for reservists to stay in critical positions.

Redesign Reserve Force Enlistment and Reenlistment Bonus Incentives

Under the current PS bonus system, the individual has no incentive to search for a job match in current skills. The current bonus system for prior service also provides only minimal incentives to choose longer terms of service or to join higher-priority units. Moreover, no incentives exist for joining sooner after active-force separation to minimize skill decay.

These problems could be addressed through a system that uses vouchers to provide bonus payments to individuals separating from the active service who join reserve service. The amount of the voucher could depend on the experience and particular military occupation of the individual, whether a skill match occurs in the reserve job, the priority of the unit joined, how soon the individual joins, and the length of commitment to reserve service. The variation in voucher amounts would reflect both the criticality of a skill and the individual's experience in that skill. We should pay higher bonus amounts to PS individuals who utilize active skills and who join the reserve sooner, because we do not have to pay retraining costs. Since attrition of PS personnel is high in the first few years, partly due to short commitments, voucher amounts should be greater for longer commitments. Variable reenlistment bonus payments for different terms have been shown to be effective in increasing time reservists are willing to commit themselves. These longer terms of commitment yield additional manyears of service (Grissmer, Burright, Doering, and Sachar, 1982; Grissmer and Hiller, 1983).

Both enlistment and reenlistment bonus payments would also be necessary to provide additional flexibility in meeting local reserve unit manpower demands. However, the balance between up-front and downstream payments should be analyzed. Higher downstream payments are warranted where training or retraining occurs, to provide incentive to complete training and to minimize loss if not com-

pleted. Downstream payments could also depend on an individual's staying in the current unit and skill. This would improve stability in skills and units.

Improving Job Proficiency of NPS Personnel

Substitution of NPS for PS personnel could occur across a wider set of grades and skills if there were more opportunity to gain additional training. This could occur by having NPS personnel perform full-time job-related service in the active components or reserve service after IADT to more fully complete the on-the-job training required for skill proficiency. Alternatively, NPS personnel could serve for periods of 6 months to 2 years at later points in their career, also to prepare for specific jobs.

The major constraints to such extended periods are civilian jobs and families. If such service were required, recruiting and retention could suffer because of the extended absence required from civilian jobs. Reservists now find it difficult to attend additional mandated courses or retraining, which extend for much shorter periods. However, some NPS personnel may want the opportunity for more extended training, especially if it means more promotion opportunity or higher pay. Currently, there is little incentive for this kind of extended training. Some testing of programs that offer extended full-time training after IADT or at different career points would help define the demand for such programs. However, if links to promotion and pay are not made, demand may not be very high.

Enhance Incentives for Joint Active-Reserve Commitment Options

This policy would provide an increased flow of active veterans into the reserve, and such programs have been initiated on a limited basis (Buddin, 1992). Such programs have a commitment at active-force entrance of both an active and reserve term of service. The number of years can vary, but 2+4 programs that have an active commitment of two years and a reserve commitment of four years are in use.

However, the effectiveness of these programs needs to be carefully evaluated. Not all persons making commitments would be utilized. Some would stay in the active service. There might not be any reserve units near the hometown of the separating soldier or any openings in the nearby units. It is also unclear how often skill matches would be used by these soldiers. In addition, individuals making reserve commitments at the beginning of active service would probably have lower reserve retention rates, since their decisions were made without knowledge of their post-service circumstances.

A key question is how to obtain the reserve commitment at the point of active accession. Essentially, this additional commitment could be voluntary or involuntary. A voluntary commitment could be encouraged by providing additional enlistment bonus payments or educational benefits to individuals who voluntarily choose a reserve commitment. This would have the advantage of allowing variation in payments, by skill, in line with the demand for a particular reserve skill.

Another option to be considered is a mandatory reserve commitment with each active enlistment. While this would greatly increase the PS supply and pool from which components choose and match skills, such a policy would also have some disadvantages.

This policy would essentially amount to a "reserve draft." The presence of nonvolunteers in reserve units could damage morale. The retention rate for these PS individuals, who would not have chosen reserve service independent of active service, is likely to be lower than that of individuals voluntarily joining the reserves. Since only about one in four veterans currently joins reserve service, the number of nonvolunteers could be substantial. This ready source of manpower may also weaken the recruiting and retention of real volunteers, and the reserve force would again be highly dependent on a "conscripted" source of manpower. Finally, a "lottery effect" would take place, because not all veterans would be needed. Many would be in areas with no openings or need for particular skills, and only a proportion of veterans are needed to fill reserve requirements. So, many would escape reserve service, and some of these would be individuals who would have volunteered in the absence of the draft but cannot now find an opening.

Integrate the Selected Reserve and Individual Ready Reserve

The Individual Ready Reserve (IRR) consists of individuals who leave active or reserve service before completing 8 years of service. These individuals have an IRR obligation until they complete 8 years of total service including time in the IRR. Individuals in the IRR neither train nor are paid, but must maintain current addresses with the Department of Defense and can be called to duty in a mobilization. The Army IRR currently numbers almost 400,000 personnel.

The IRR mission has been to provide fillers for casualties in long, intense combat scenarios. These scenarios are now much less likely with the dissolution of the Warsaw Pact, and alternate utilization can be considered.

A new mission that should be evaluated is to use the IRR for predesignated cross-leveling of reserve units. Reserve units cannot maintain fully deployable units in peacetime because of the inherent delay in recruiting and training personnel for vacant positions in units. These untrained personnel, together with other individuals who do not attend annual training, also make unit training less effective. Units often attend annual training with only 70 percent of positions filled.

IRR personnel with the appropriate skills and experience could be associated with reserve units in peacetime to maintain fully deployable units. If these individuals also were paid, they could participate in annual training and make training more effective while gaining experience with unit personnel. IRR personnel could be recruited from a much wider geographical area if only annual training were required. IRR personnel would not occupy positions permanently but would be "on retainer." A pool of IRR personnel who have skills demanded in a particular unit would be associated with that unit. However, the participation of individuals with the unit would depend on the specific vacancies at a specific time.

Some individuals who have been in the IRR for a long time may have significant skill decay and may require some training before qualifying for a deployable position. However, the pool of IRR personnel is substantially larger than the number of vacant positions in the Army Selected Reserve, and only a small portion—probably under 25 percent—would be needed to give all reserve units a fully deployable complement of personnel. Of course, the units in a region with higher mobilization priorities could have higher-priority access to the IRR.

Establish PS Goals

Establishing PS content goals for reserve components is one approach to aiding utilization of PS personnel. Such goals would provide visibility to an important personnel characteristic of reserve forces and provide organizational incentives to increase PS content. However, a preferred approach to accomplishing better utilization of PS personnel is redesign of the compensation system so as to provide a natural set of incentives for PS individuals to join, seek appropriate jobs, and stay in reserve service. Appropriate design of these incentives could not only achieve higher levels of PS personnel but also better utilization of PS skills within the reserves. The legislative approach does not address the important issue of how PS personnel are utilized. In the absence of major changes in the compensation structure, some progress may be possible on PS content, but there are several potential problems with a legislated approach.

One of the main problems is to determine the appropriate level of PS personnel and the required level of active experience. This will vary by reserve mission and skill mix and should be determined from a bottom-up analysis of reserve-unit positions and the appropriate experience levels needed for each position. The ideal situation for utilization of PS personnel is to provide an individual enough active service for a given skill to achieve a high level of proficiency, then to promote maintaining and utilizing this skill in the reserve forces for a long time.

The ideal period of active service would vary by skill and reserve position. Some skills have rapid learning curves, and active terms of less than two years may be sufficient to achieve high proficiency. In fact, some skills may be learned with IADT and reserve duty, and these should be open to NPS personnel. However, many skills may require much longer than two years to achieve high levels of proficiency and requiring only two years of prior service would clearly not be enough.

We wish to reiterate that we are not implying that prior active service by itself equates to proficiency in a given skill, nor that this should be the only variable considered. Judgments of local commanders regarding relative proficiency levels of PS and NPS personnel and the level of experience required in various jobs must weigh heavily when establishing PS goals. It is important to understand that both PS and NPS personnel will have an overlapping distribution of proficiencies in a given job, which implies that every PS individual is not more proficient than an NPS individual. However, on average, it seems likely that a PS reservist, all other things being equal, is likely to be both more experienced and more proficient in certain jobs than the average NPS individual.

The reserve forces not only utilize specific occupational skills, but many individuals will rise to positions in which they must supervise and train other reservists and exercise leadership. This type of experience is not usually obtained in the active force until midcareer, and these reserve positions should ideally be manned by individuals with more active experience than a single term of service. Only a position-by-position analysis taking account of skill, unit priority, and grade can establish appropriate PS goals.

PS goals also do not acknowledge that useful experience in achieving proficiency in military jobs can come through civilian experience. Some civilian experience transfers directly into military jobs. Pilots, physicians, heavy equipment operators, and mechanics can all bring high levels of proficiency to reserve jobs. If we do not acknowledge this type of experience, then PS content goals will create perverse incentives for the components to choose a PS person unskilled in a given job over a NPS person with a high level of proficiency.

An additional problem in defining PS goals is the treatment of full-time reserve service. Although the proportion of full-time personnel who have active service is higher than that for part-time personnel, many full-timers do not have active service. Should these individuals be counted as NPS, or should their full-time reserve service qualify as prior active service? Many full-time technicians have over 20 years of service; provided their full-time jobs are directly related to their unit positions, they are among the best qualified whether they have active service or not. Other full-time personnel may have jobs that are not directly related to their part-time unit positions, and their full-time experience may not be as valuable.

An additional issue is whether to apply PS content rules to the entire reserve inventory or only to those who would deploy in the event of a mobilization. It is ultimately for deployed units that PS content may be important. Peacetime units carry a significant number of personnel who are in training but would not be able to be deployed until fully trained. Is the PS content of this training pipeline important, or should we be concerned only with personnel deployable at a given time? Cross-leveling would occur in mobilization that would place reservists from other units or even active personnel in these positions. This cross-leveling may well raise the PS content of the deployed units above their peacetime counterparts. So, a question arises as to the PS content of what portion of reserve forces.

Another question that arises is the treatment of warrant officers. The congressional goals established more stringent goals for officers and enlisted personnel. Did congress's definition of officer include warrant officers, or should they be counted with enlisted personnel? This is an important distinction, because warrant officers have higher PS content than either part-time officer or enlisted personnel, and there is about one warrant for each four officers in the ARNG. Including warrants with officers would make the goals for officer PS content much less stringent.

Finally, PS content rules do not recognize the individual qualities of personnel, which may well be as important to job and unit performance as prior active or even civilian experience. Not all PS personnel will provide better performance than NPS personnel—although across all personnel in similar jobs, the average performance of PS

personnel may well be better than NPS personnel. However, these more intangible aspects of job performance argue for some flexibility in manning reserve positions, but that flexibility must be exercised by people knowledgeable about these intangible aspects.

The final issue with legislating overall goals is the need to address a number of definitional problems. Appendix A presents evidence that shows a moderate amount of sensitivity of the PS content of officers and enlisted personnel to different definitions of prior service. Part of this sensitivity is due to the inability of present data sources to unambiguously identify prior active service personnel. Reserve personnel can earn active-duty days through IADT, annual training, and other training activities. Present data elements cannot distinguish active duty service earned through active and reserve service. Some further research can narrow the range of uncertainty due to this, but further data collection may be necessary to improve estimates.

Generic Reserve Force Problems

It is important in assessing policies to understand that some personnel readiness problems are simply generic to reserve forces. Even components that are relatively small with respect to their active counterparts cannot be counted on to have full complements of trained personnel at all times. The only way that active units can maintain close to fully trained personnel in all positions in high-priority units is to give these units assignment priorities and geographically move individuals from other units. The reserve forces do not have the flexibility of moving individuals in peacetime to match unit needs. This means that each unit must recruit and train for vacancies as they occur. Recruiting depends on the uncertainties of the local labor market, and attrition for unit positions cannot reliably be predicted well enough in advance to start recruiting and training early. Retraining of reservists into new skills usually takes between 6 and 12 months simply because of the lack of training time for reservists. Positions will be vacant during this period if mobilization occurs.

Overmanning of reserve units probably cannot effectively address this problem, because it is difficult to predict which positions to overman. Failure to predict this could result in many individuals being trained for positions that do not become vacant.

The proportion of positions that do not have mobilizable individuals varies between less than 10 percent for the air components and over 25 percent for Army components. This level depends on unit and skill turnover rates and the length of time required for retraining. While this percentage can probably be reduced, some cross-leveling may well be necessary, either before or after mobilization, reflecting perhaps an inherent constraint in reserve force manning.

RESEARCH DIRECTIONS

Job Proficiency of PS and NPS Personnel

An important research question is the relative job proficiency of PS and NPS personnel and how this proficiency varies by types of skills, levels of previous active and reserve military experience, and actual experience on a specific job. Research is also needed on job proficiency when PS personnel are retrained into different skills. Since most PS personnel eventually move into different skills, research on the retraining process is important. Research is also needed on the question of skill decay and relearning for long gaps between active and reserve service.

The value of active military experience for more senior ranks is especially needed. Assessments need to be made to determine where PS experience is most needed and to place experience requirements on the jobs that most effectively utilize prior active experience.

It is also important to try to assess what particular factors make PS personnel valuable in reserve service. PS personnel have both specific skills relative to a particular job and more generic military skills learned from participation in the active force. However, another factor making PS personnel valuable is simply that they have been screened and credentialed by completing an active term, and this enables them to be a better investment for further training and service. Since PS personnel so frequently change skills upon reserve force entry, the latter two effects may be important components of assessing their value.

Such research would be needed to determine how long a period of active service is most useful for reserve service. If generic skills and screening provide the primary value, shorter terms that provide military orientation and screen for trainability may be as useful as longer terms that focus on specific job experience.

Besides research aimed directly at job proficiency measurements, another approach is to study promotion patterns in the reserve forces to determine the characteristics of those advancing at a faster pace. If we assume that promotions provide assessments of relative overall proficiency, analysis of promotion patterns for individuals having different mixes of previous military experience and job experience could reveal preferences. One problem with such analysis may be that reserve promotions are determined not only by proficiency but also by circumstances in civilian jobs and families and local characteristics.

Another area requiring research is the value of civilian experience to various reserve jobs. NPS personnel with specific types of civilian experience can be preferable to PS personnel. The degree and extent of transferability of civilian experience is an important issue if PS content goals are being set.

Behavior of NPS and PS Personnel

While much research has focused on studying PS and NPS personnel separately, more work is needed comparing the relative differences in behavior. For instance,

while PS and NPS attrition studies have determined the cohort attrition patterns of each, none has determined whether PS or NPS personnel will provide more years of service or determined the relative return taking into account the cost of recruiting, training, and compensation. Such studies need to take into account the frequent occurrence of separation and reentry into the same or a different component (Kirby and Grissmer, 1993).

Research is needed on the existence of queues of PS personnel in specific locations and for specific skills. We also need to know whether propensities to enlist in reserve service differ for officers and enlisted personnel and for different services and the extent to which geographical nonavailability of units occurs for those willing to join.

More research is needed on skill and unit turnover (Buddin and Grissmer, 1993). The motivation for changing units needs to be more clearly identified, and the role of promotion opportunity in changing skills needs to be investigated. Are turnover rates dependent on availability of nearby units and promotion opportunity? Does turnover vary in different locations, and what explains these variations? What explains differences in turnover rates among components?

More research is needed on skill matching and skill retraining for PS personnel. PS personnel may switch skills on entering the reserves because there are no openings in their skill areas, because there are few units available nearby, or simply because they wish to switch skills. Such information is needed to evaluate whether improved skill matching would occur if veterans are given incentives for searching for such a match.

Finally, structured experimentation that tests many of the personnel and compensation policies suggested here is needed. Testing these policies on a limited basis is preferable to full-scale implementation. Several experiments on active force personnel and compensation policy have been done (Jaquette, 1974; Asch, 1993; Polich, 1986; Buddin, 1992). These experiments helped to structure an improved system of military pay and educational benefits and were partly responsible for the turnaround in quality of active recruits in the early 1980s. Similar experimentation is needed that focuses on total force personnel and compensation policy. These experiments could, for example, focus on testing the effectiveness of the following:

- Vouchers for active-duty separateness, encouraging them to join the reserves by providing compensation that varies according to specific skill, matching of active with reserve skills, gap in service, and type of reserve unit joined
- Higher proficiency pay for personnel in high-priority units and/or high-priority skills, to reduce turnover
- Higher enlistment bonuses and educational benefits for new active personnel who commit to various combinations of both active and reserve duty (such as 2+4, 3+3, 4+2).

These experiments are needed to help determine the best mix of new initiatives as well as how far they might go in raising PS content.

SENSITIVITY OF PS ESTIMATES TO ASSUMPTIONS

The current estimates of PS content of the FY89 inventories are moderately sensitive to the assumptions and definitions utilized in the estimation. The major sensitivities involve the following:

- whether 18 or 24 months of active service is used
- whether estimates include part-time or both full-time and part-time duty
- whether full-time personnel are all classified as PS
- whether warrants are included with officers
- whether TAFMS is adjusted to exclude AT and IADT.

Figure A.1 shows the sensitivity of an estimate of the PS content of ARNG officers and enlisted personnel to different definitions of prior service. This estimate does not adjust TAFMS to eliminate annual training time. For enlisted personnel, we have shown the sensitivity to the minimum term of service (18 versus 24 months) and

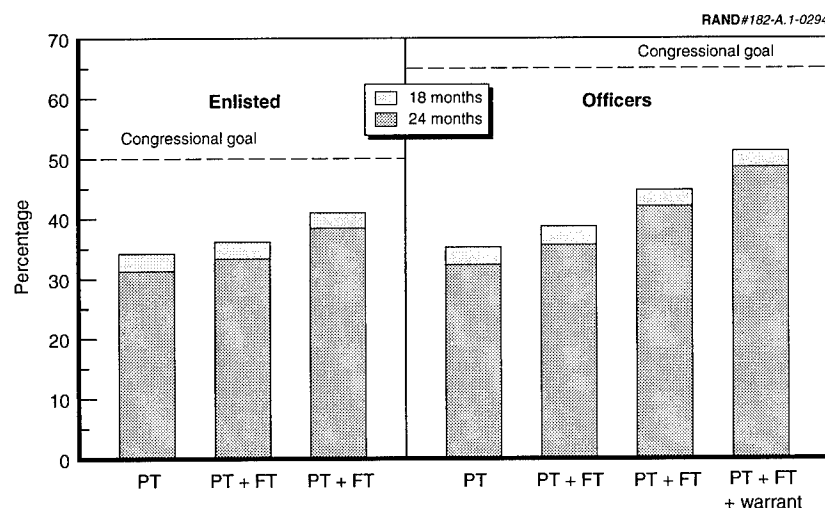


Figure A.1—Sensitivity of ARNG PS Estimates to Different Assumptions

treatment of full-time personnel. The sensitivity to 18 versus 24 months arises partly because some individuals who take 2-year terms receive early discharges. The first estimate shows a PS content for the part-time force of only 29 or 33 percent, depending on whether 24 or 18 months of active service is required. The second estimate includes full-time personnel in the estimate, but counts them as PS only if they meet the PS criteria. These estimates show PS content at 32 or 36 percent. The final estimate assumes all full-time personnel are counted as PS and gives estimates of 38 or 42 percent.

For officers, the corresponding estimates exclude warrant officers and start at 38 percent and rise to 48 percent using an 18-month definition. The last estimate shows the effect of including warrant officers and boosts the estimates to 55 percent. Clearly, the congressional goals would need further specification before they can be applied.

Figures A.2 through A.7 show further sensitivity to the assumption regarding TAFMS adjustments. The figures show the effects of TAFMS adjustments for the part-time, full-time and part-time + full-time ARNG officers and enlisted personnel in FY89 assuming 12 (PS12), 18 (PS18) and 24 (PS24) months criteria. The TAFMS adjustments (APS12, APS18, APS24) made are for annual training time only and simply subtract 0.5 month of service for each year of reserve service. This adjustment still overstates the months of actual continuous duty since it does not include IADT or any additional training the reservists may have had on active duty.

The results show that TAFMS adjustments can make a 3–5 percentage point difference in PS content for part-time personnel. The amount of the adjustment will vary by component, since it depends primarily on the proportion of more senior NPS personnel. Components with fewer senior NPS personnel can be expected to have smaller TAFMS adjustments in the PS content estimate. Table A.1 shows estimates

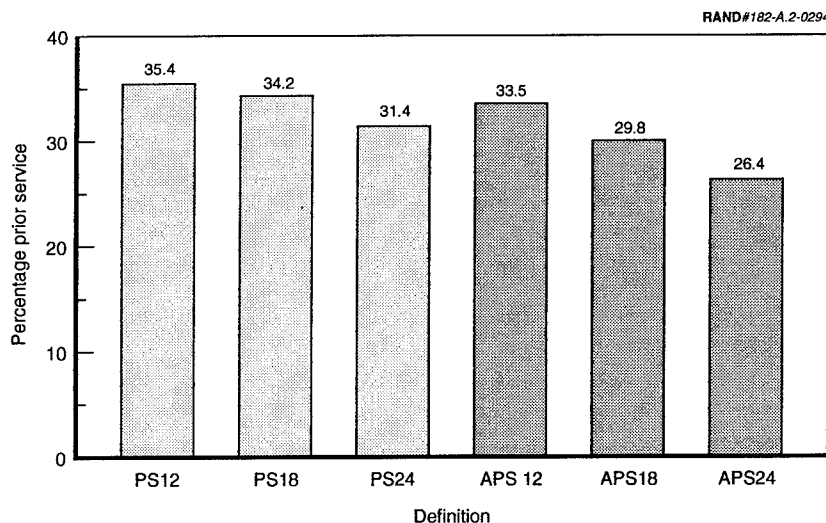


Figure A.2—ARNG PS Content Estimates for Enlisted Part-Timers Under Different Assumptions in FY89

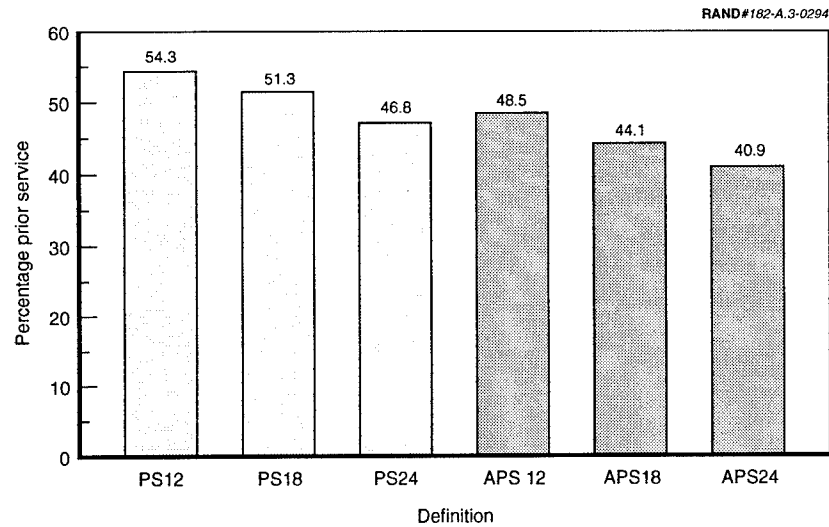


Figure A.3—ARNG PS Content Estimates for Enlisted Full-Timers Under Different Assumptions

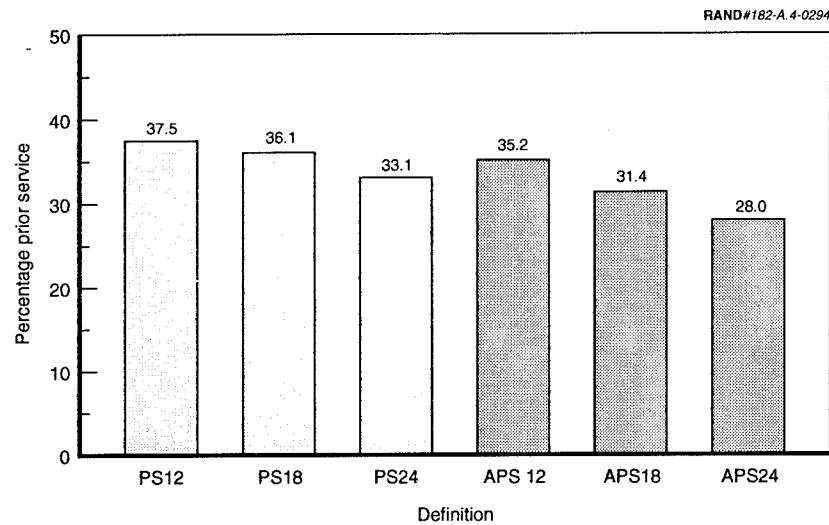


Figure A.4—ARNG PS Content Estimates for All Enlisted Personnel Under Different Assumptions

similar to those given for the ARNG for the other five components. Tables A.2 through A.6 show data for the other five reserve components.

Since the TAFMS adjustments can make a difference in current estimates of PS content, it is important to determine how large increments in TAFMS are for NPS personnel in the reserve components. Figure A.8 shows mean adjustments made to TAFMS for reserve NPS personnel during FY89. These values were computed by

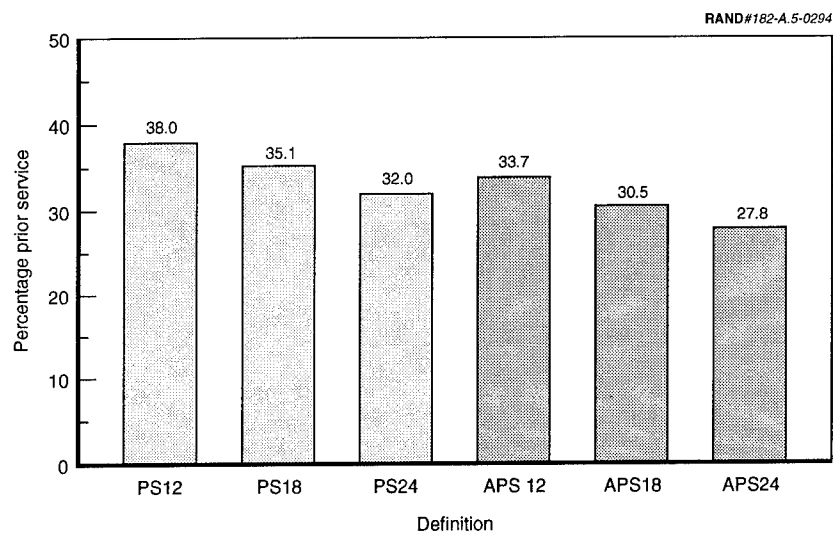


Figure A.5—ARNG PS Content Estimates for Part-Time Officers Under Different Assumptions

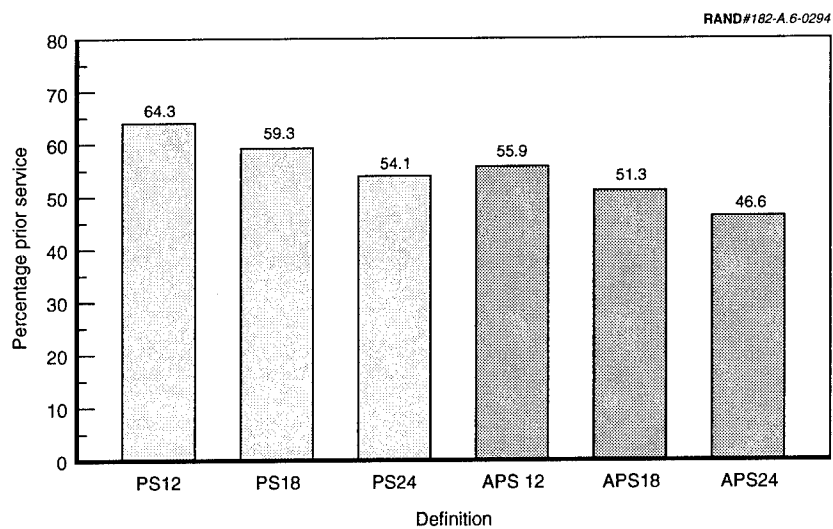
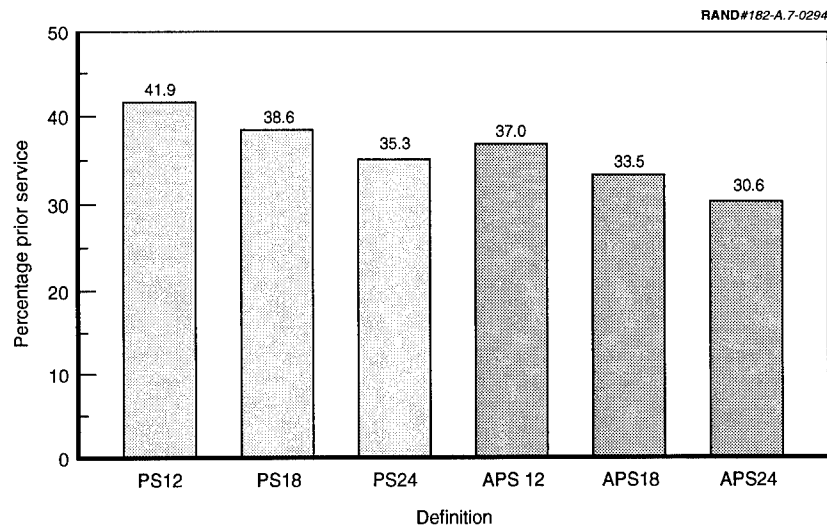


Figure A.6—ARNG PS Content Estimates for Full-Time Officers Under Different Assumptions



**Figure A.7—ARNG PS Content Estimates for All Officers
Under Different Assumptions in FY89**

**Table A.1
FY89 PS Content for ARNG**

	Sample N	PS Proportion Under Different Assumptions					
		PS12	PS18	PS24	APS12	APS18	APS24
Enlisted							
Full-time	4,114	0.577	0.545	0.497	0.513	0.466	0.433
Part-time	36,110	0.352	0.340	0.312	0.333	0.297	0.263
Officers							
Full-time	599	0.643	0.593	0.541	0.559	0.512	0.466
Part-time	3,468	0.380	0.351	0.320	0.337	0.305	0.278
Warrants							
Full-time	314	0.688	0.608	0.506	0.490	0.449	0.404
Part-time	625	0.744	0.677	0.622	0.651	0.586	0.541

NOTE: PS12 = Uses 12 months of active duty and unadjusted TAFMS.

PS18 = Uses 18 months of active duty and unadjusted TAFMS.

PS24 = Uses 24 months of active duty and unadjusted TAFMS.

APS12 = Uses 12 months of active duty and adjusted TAFMS.

APS18 = Uses 18 months of active duty and adjusted TAFMS.

APS24 = Uses 24 months of active duty and adjusted TAFMS.

Table A.2
FY89 PS Content for USAR

	Sample N	PS Proportion Under Different Assumptions					
		PS12	PS18	PS24	APS12	APS18	APS24
Enlisted							
Full-time	1,404	0.909	0.877	0.855	0.874	0.850	0.809
Part-time	22,969	0.427	0.396	0.369	0.394	0.365	0.309
Officers							
Full-time	324	0.941	0.904	0.895	0.914	0.895	0.889
Part-time	5,320	0.632	0.589	0.559	0.569	0.538	0.495
Warrants							
Full-time	112	0.964	0.920	0.866	0.848	0.839	0.750
Part-time	360	0.878	0.750	0.678	0.689	0.639	0.564

See Table A.1 for description of PS12, PS18, PS24, APS12, APS18, and APS24.

Table A.3
FY89 PS Content for USNR

	Sample N	PS Proportion Under Different Assumptions					
		PS12	PS18	PS24	APS12	APS18	APS24
Enlisted							
Full-time	1,690	0.974	0.959	0.933	0.974	0.957	0.930
Part-time	10,747	0.556	0.542	0.532	0.546	0.531	0.475
Officers							
Full-time	259	0.919	0.919	0.915	0.919	0.919	0.911
Part-time	2,727	0.646	0.634	0.626	0.632	0.622	0.606
Warrants							
Full-time	1	1.000	1.000	1.000	1.000	1.000	1.000
Part-time	25	0.760	0.640	0.600	0.600	0.600	0.600

See Table A.1 for description of PS12, PS18, PS24, APS12, APS18, and APS24.

Table A.4
FY89 PS Content for USMCR

	Sample N	PS Proportion Under Different Assumptions					
		PS12	PS18	PS24	APS12	APS18	APS24
Enlisted							
Full-time	200	0.030	0.020	0.015	0.025	0.020	0.015
Part-time	3,920	0.086	0.062	0.056	0.073	0.058	0.050
Officers							
Full-time	39	0.026	0.026	0.026	0.026	0.026	0.026
Part-time	317	0.625	0.618	0.615	0.618	0.612	0.609
Warrants							
Full-time	11	0.091	0.091	0.091	0.091	0.091	0.091
Part-time	50	0.840	0.680	0.580	0.580	0.560	0.520

See Table A.1 for description of PS12, PS18, PS24, APS12, APS18, and APS24.

Table A.5
FY89 PS Content for ANG

	Sample N	PS Proportion Under Different Assumptions					
		PS12	PS18	PS24	APS12	APS18	APS24
Enlisted							
Full-time	2,806	0.869	0.785	0.703	0.737	0.684	0.652
Part-time	7,549	0.634	0.563	0.522	0.560	0.526	0.480
Officers							
Full-time	309	0.913	0.893	0.848	0.922	0.880	0.871
Part-time	1,066	0.844	0.784	0.721	0.764	0.713	0.662

See Table A.1 for description of PS12, PS18, PS24, APS12, APS18, and APS24.

Table A.6
FY89 PS Content for USAFR

	Sample N	PS Proportion Under Different Assumptions					
		PS12	PS18	PS24	APS12	APS18	APS24
Enlisted							
Full-time	923	0.901	0.878	0.857	0.914	0.888	0.870
Part-time	5,861	0.745	0.670	0.669	0.703	0.672	0.639
Officers							
Full-time	109	0.826	0.853	0.835	0.963	0.963	0.954
Part-time	1,587	0.860	0.834	0.816	0.827	0.813	0.786

See Table A.1 for description of PS12, PS18, PS24, APS12, APS18, and APS24.

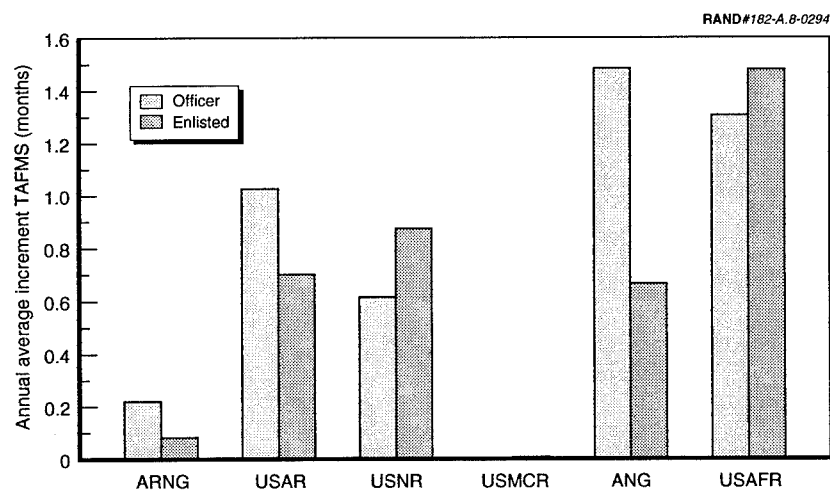


Figure A.8—Average TAFMS Adjustments for FY89 for NPS Personnel

matching end-FY88 and end-FY89 personnel records and computing the difference in TAFMS for personnel present on both tapes. These data show first that not all components make adjustments to TAFMS. It appears that the ARNG and Marine Corps do not make the required TAFMS adjustments annually. So, for these components, PS estimates should be made from the unadjusted estimates. Second, these data show that the annual adjustments for certain components and types of personnel are considerably larger than would be expected from annual training time alone (0.5 month).

This larger adjustment could arise from a few people spending considerable time on active duty. To test this, we computed the same averages but excluded those whose TAFMS were incremented more than 4 months. Figure A.9 shows these estimates, which are much closer to the level of annual training time. However, even these show that officers in the air components receive significantly more active-duty days than annual training time would account for. This will make it even more difficult to develop highly accurate PS estimates for these components, since the TAFMS increments could well vary from year to year.

For this study, we have defined PS content using an 18-month definition and using the TAFMS adjusted definitions for all services except the ARNG and Marine Corps, since it appears they do not increment TAFMS. We have adjusted TAFMS assuming 0.5 month annually for training. This adjustment will make our PS estimates slightly higher than the actuals for those components whose training patterns result in more than two weeks of active duty training a year. The 18-month definition also will result in a higher PS estimate than the 24-month definition. Our estimates for FY89 are then close to upper limits on PS content if the strict criterion of 24 months of continuous active duty remains the congressional criterion. However, it is important to recognize that the 2010 projections will be relatively insensitive to these initial assumptions, since the PS content in 2010 is determined mainly by PS accessions between 1992 and 2010. Our methodology assumes that entering personnel are PS only if they have served in the active force.

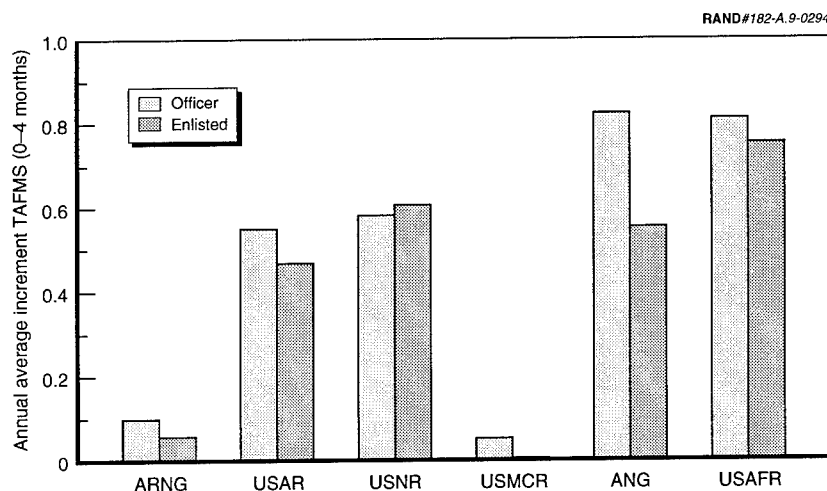
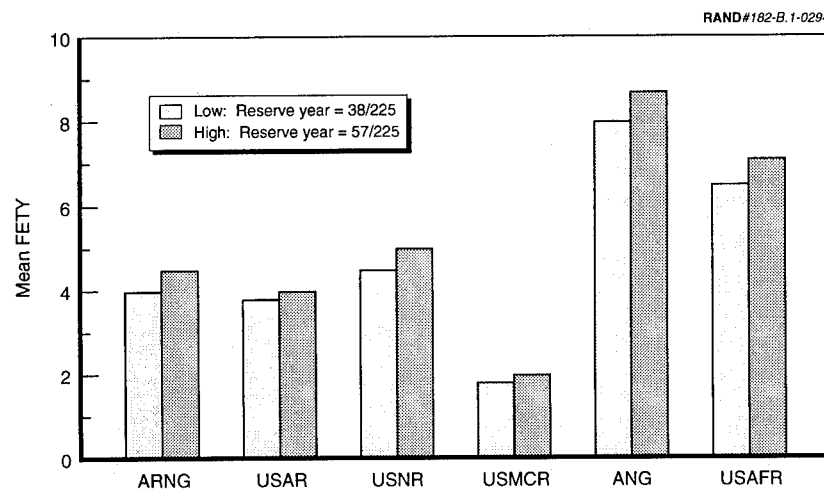


Figure A.9—Average TAFMS Adjustments for FY89 for NPS Personnel Excluding Those with Increments > 4 Months

SENSITIVITY OF FETY TO RESERVE TRAINING DAYS

By assigning only 38 days of service to reservists, our FETY measure ignores additional training assemblies (ATAs) and other types of school or field training not covered by drill and annual training days. To test whether this omission creates a large bias in our FETY measure, we performed a sensitivity analysis showing how total FETY would be affected if we assume 55 days of annual drills and training rather than 38. Giving 55 days for each year of reserve service more than covers total additional time spent by reservists. Even with this assumption, Figure B.1 shows that the average level of military experience measured by FETY would change little if reservists would serve 55 rather than 38 days a year.

This is because reserve service provides less than one-third and often only one-fifth of the component's military experience for reservists. Figures B.2 and B.3 demonstrate the contribution of each kind of experience—full-time, prior active, and strictly reserve—to the overall average level of experience in each of the reserve components. The data for officers show that the air components have the highest level of military experience—an average of about 9 years of FETY. The Navy and Marine offi-



**Figure B.1—Sensitivity of FETY to Annual Reserve Time:
Enlisted Personnel, FY89**

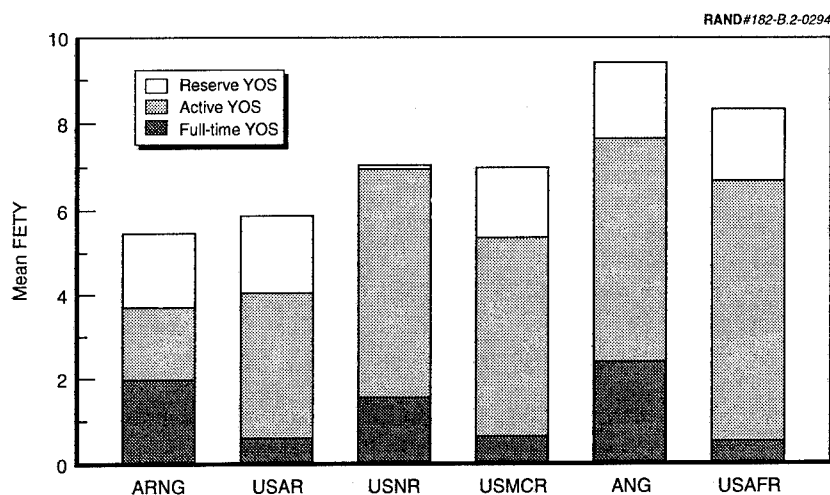


Figure B.2—Sources of FETY in the Reserve Components: Officers, FY89

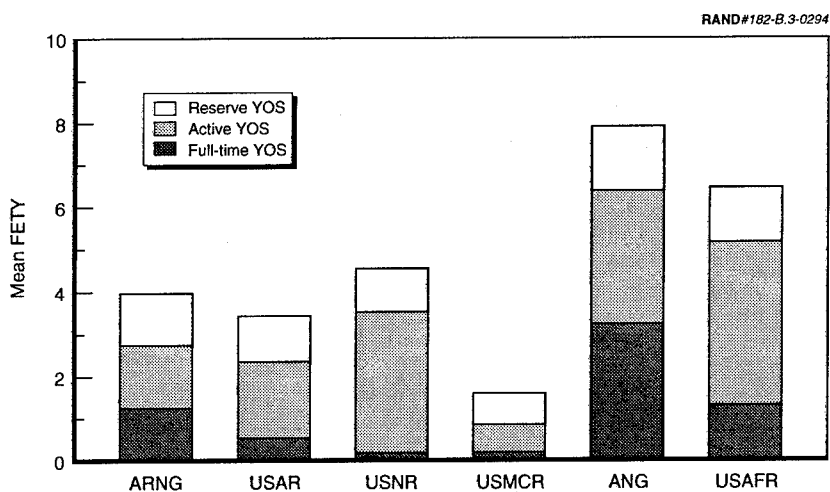


Figure B.3—Sources of FETY in the Reserve Components:
Enlisted Personnel, FY89

cers have an average of 7 FETY, while the Army components have between 5 and 6 years of FETY.

The air, Navy and Marine components depend extensively on the active force for their depth of experience. About two-thirds of the total base of military experience for reserve personnel in these components comes from active experience. Over three-fourths of the base of experience comes either from full-time reserve service or active service. Alternatively, reserve drills and annual training provide less than 25 percent of the military experience of officers in these components.

Army component officers have the least experience of the components and draw more of their experience from reserve service. For ARNG officers, about one-third of experience comes from reserve service, one-third from active experience, and one-third from full-time service.

REFERENCES

- Asch, Beth J., *Designing Military Pay*, Santa Monica, Calif.: RAND, MR-161-FMP, 1993.
- Buddin, Richard, Daniel Levy, Janet Hanley, and Donald Mark Waldman, *Promotion Tempo and Enlisted Retention*, Santa Monica, Calif.: RAND, R-4135-FMP, 1992.
- Buddin, Richard, *Analysis of Early Military Attrition Behavior*, Santa Monica, Calif.: RAND, R-3069-MIL, 1984.
- Buddin, Richard J., *Enlistment Effects of the 2+2+4 Recruiting Experiment*, Santa Monica, Calif.: RAND, R-4097-A, 1991.
- Buddin, Richard, and David Grissmer, *Skill Qualification and Turbulence in the Army National Guard and Army Reserve*, Santa Monica, Calif.: RAND, R-4280-RA, 1994.
- Buddin, Richard, *Trends in Attrition of High-Quality Military Recruits*, Santa Monica, Calif.: RAND, R-3539-FMP, 1988.
- Burright, B., David Grissmer, and Zahava Doering, *A Model of Reenlistment Decisions of Army National Guardsmen*, Santa Monica, Calif.: RAND, R-2866-MRAL, 1982.
- Grissmer, David W., G. K. Burright, Zahava D. Doering, and Jane Sachar, *The 1978 Selected Reserve Reenlistment Bonus Test: Executive Summary*, Santa Monica, Calif.: RAND, R-2864-MRAL, 1982.
- Grissmer, David W., Richard Buddin, and Sheila Nataraj Kirby, *Improving Reserve Compensation: A Review of Current Compensation and Related Personnel and Training Readiness Issues*, Santa Monica, Calif.: RAND, R-3707-FMP/RA, 1989.
- Grissmer, D. W., and J. R. Hiller, *Follow-Up of Participants in the 1978 Selected Reserve Reenlistment Bonus Test*, Santa Monica, Calif.: RAND, N-1880-MRAL, 1983.
- Grissmer, David W., and Sheila N. Kirby, *Attrition of Nonprior Service Reservists in the Army National Guard and Army Reserve*, Santa Monica, Calif.: RAND, R-3267-RA, 1985.

Grissmer, David W., and Sheila Nataraj Kirby, *Changing Patterns of Nonprior Service Attrition in the Army National Guard and Army Reserve*, Santa Monica, Calif.: RAND, R-3626-RA, 1988.

Grissmer, David W., and Sheila Nataraj Kirby, *Attrition During Training in the Army Reserve and Army National Guard*, Santa Monica, Calif.: RAND, N-2079-RA, 1984.

Grissmer, David W., Sheila Nataraj Kirby, and Man-bing Sze, *Factors Affecting Reenlistment of Reservists: Spouse and Employer Attitudes and Perceived Unit Environment*, Santa Monica, Calif.: RAND, R-4011-RA, 1991.

Grissmer, David, Zahava Doering, and Jane Sachar, *The Design, Administration and Evaluation of the 1978 Selected Reserve Reenlistment Bonus Test*, Santa Monica, Calif.: RAND, R-2865-MRAL, 1982.

Horne, David K., "The Impact of Soldier Quality on Army Performance," *Armed Forces & Society*, Vol. 13, No. 3, Spring 1987, pp. 443-455.

Hosek, James R., John Antel, and Christine E. Peterson, *Who Stays, Who Leaves? Attrition Among First-Term Enlistees*, Santa Monica, Calif.: RAND, N-2967-FMP, 1989.

Jaquette, D. L., and G. R. Nelson, *Implications of Manpower Supply and Productivity for the Pay and Compensation of the Military Force*, Santa Monica, Calif.: RAND, R-1451-ARPA, 1974.

Joint Chiefs of Staff, *JCS Publication 1-02*, December 1, 1989.

Kawata, Jennifer H., David W. Grissmer, and Richard Eisenman, *The Reserve Force Policy Screening Models (POSM): A User's Manual*, Santa Monica, Calif.: RAND, R-3701-JCS/RA/FMP, 1989.

Kirby, Sheila Nataraj, and David Grissmer, *Reassessing Enlisted Reserve Attrition: A Total Force Perspective*, Santa Monica, Calif.: RAND, N-3521-RA, 1993.

Klein, Stephen, Jennifer Hawes-Dawson, and Thomas Martin, *Why Recruits Separate Early*, Santa Monica, Calif.: RAND, R-3980-FMP, 1991.

Marquis, M. Susan, and Sheila Nataraj Kirby, *Accession and Attrition of Prior-Service Reservists*, Santa Monica, Calif.: RAND, N-2946-RA, 1989a.

Marquis, M. Susan, and Sheila Nataraj Kirby, *Economic Factors in Reserve Attrition: Prior Service Individuals in the Army National Guard and Army Reserve*, Santa Monica, Calif.: RAND, R-3686-1-RA, 1989b.

Marquis, M. Susan, and Sheila Nataraj Kirby, *Reserve Accessions Among Individuals with Prior Military Service: Supply and Skill Match*, Santa Monica, Calif.: RAND, R-3892-RA, 1989c.

National Defense Research Institute, *Assessing the Structure and Mix of Future Active and Reserve Forces: Final Report to the Secretary of Defense*, Santa Monica, Calif.: RAND, MR-140-1-OSD, 1992.

- Polich, J. M., and J. N. Dertouzos, *The Enlisted Bonus Experiment*, Santa Monica, Calif.: RAND, R-3353-FMP, 1986.
- Scribner, Barry L., D. Alton Smith, Robert H. Baldwin, and Robert L. Phillips, "Are Smart Tankers Better? AFQT and Military Productivity," *Armed Forces & Society*, Vol. 12, No. 2, Winter 1986, pp. 193-206.
- Tan, Hong W., *Nonprior Service Reserve Enlistments: Supply Estimates and Forecasts*, Santa Monica, Calif.: RAND, R-3786-FMP/RA, 1991.
- U.S. House of Representatives, *Assessment of the Structure and Mix of Active and Reserve Forces, Conference Report*, H.R. 102-311, 1992a.
- U.S. House of Representatives, *Report of the Committee on Armed Services, National Defense Authorization Act for Fiscal Year 1993*, H.R. 102-966, 1992b.
- U.S. Senate Committee on Armed Services, *National Defense Authorization Act for Fiscal Years 1992 and 1993*, S.R. 102-114, 1992.
- Ward, Michael P., and Hong W. Tan, *The Retention of High-Quality Personnel in the U.S. Armed Forces*, Santa Monica, Calif.: RAND, R-3117-MIL, 1985.